

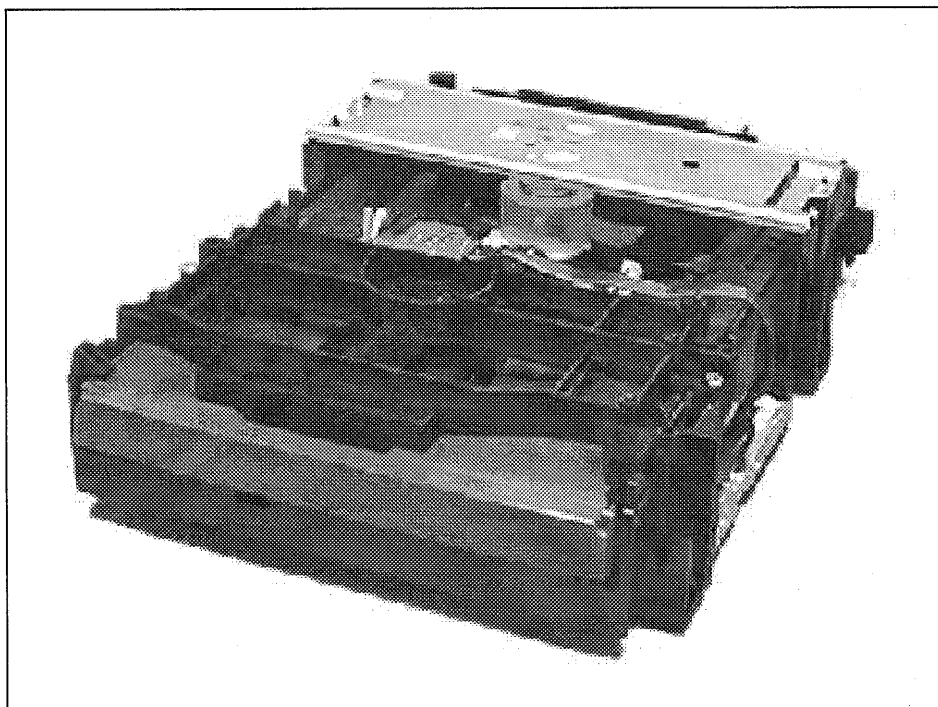
Technical Guide

5-Disc CD Changer

CR20

Mechanism

**Operation Description and
Disassembly and Reassembly
Procedures**

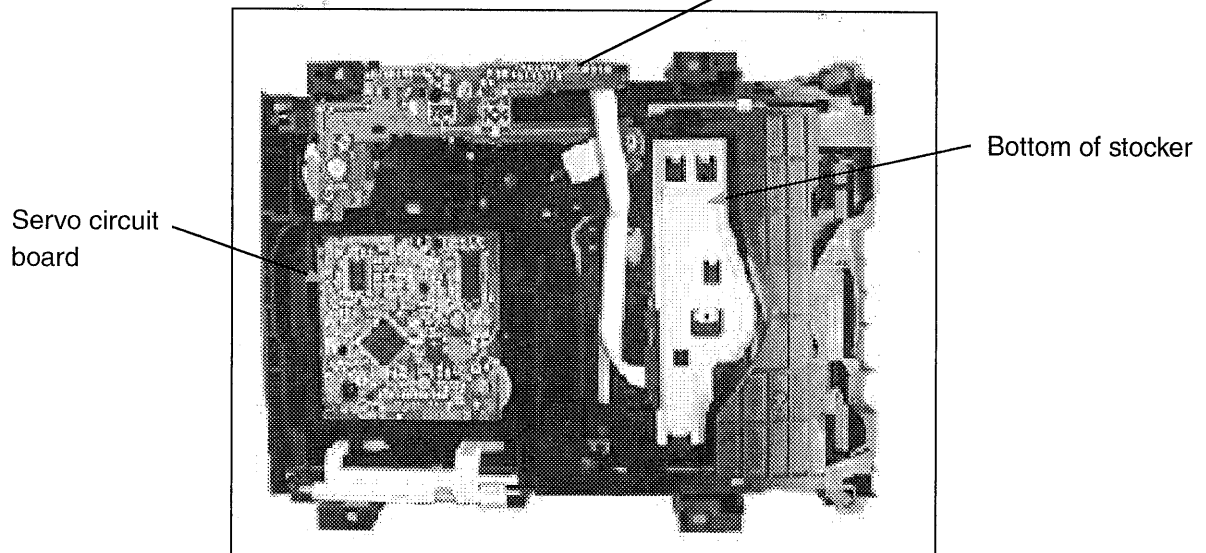
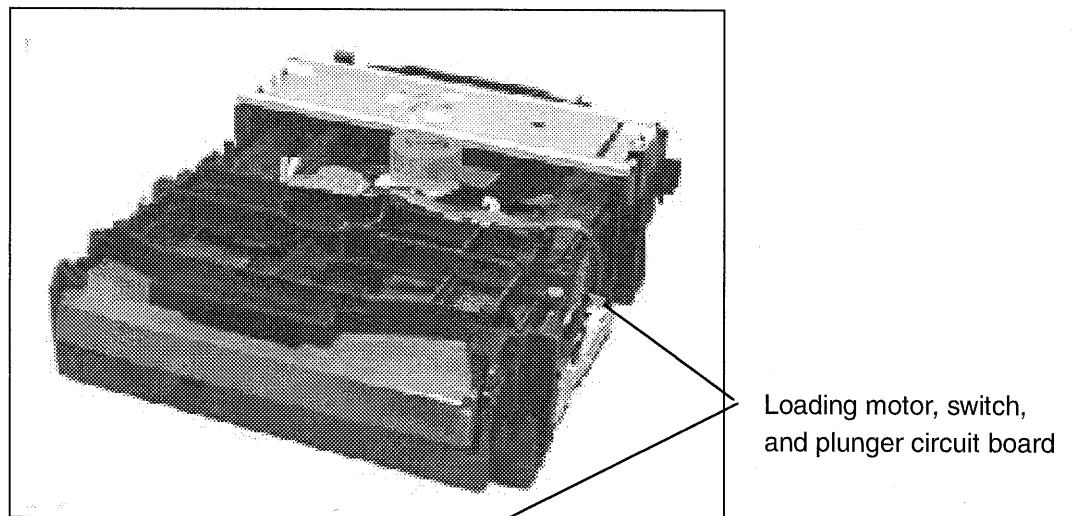
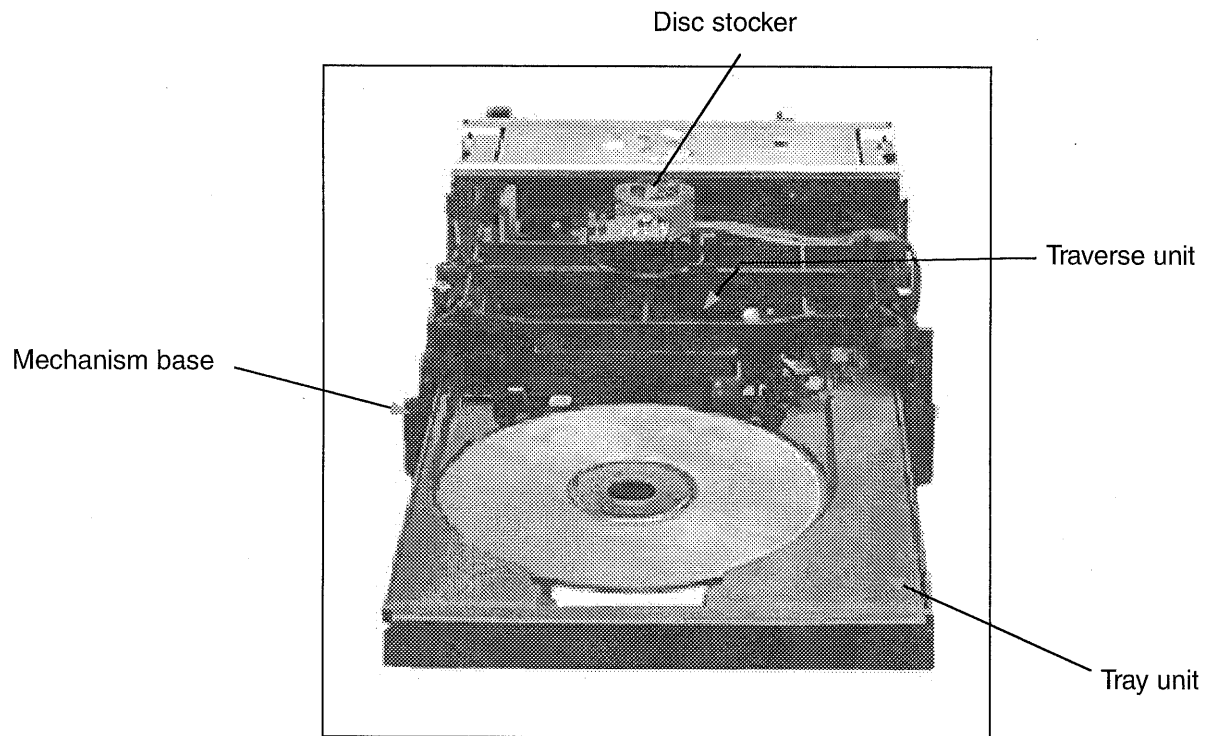


Technical Support Section,
Quality Promotion Department, Audio Division

Contents

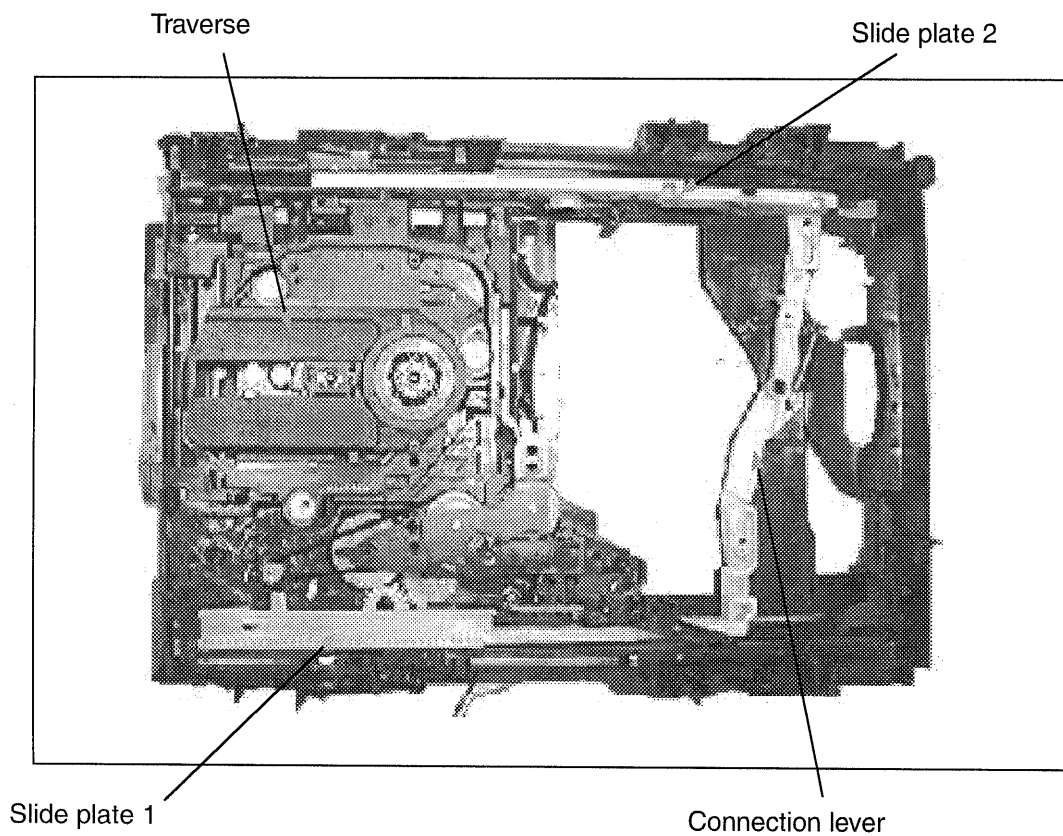
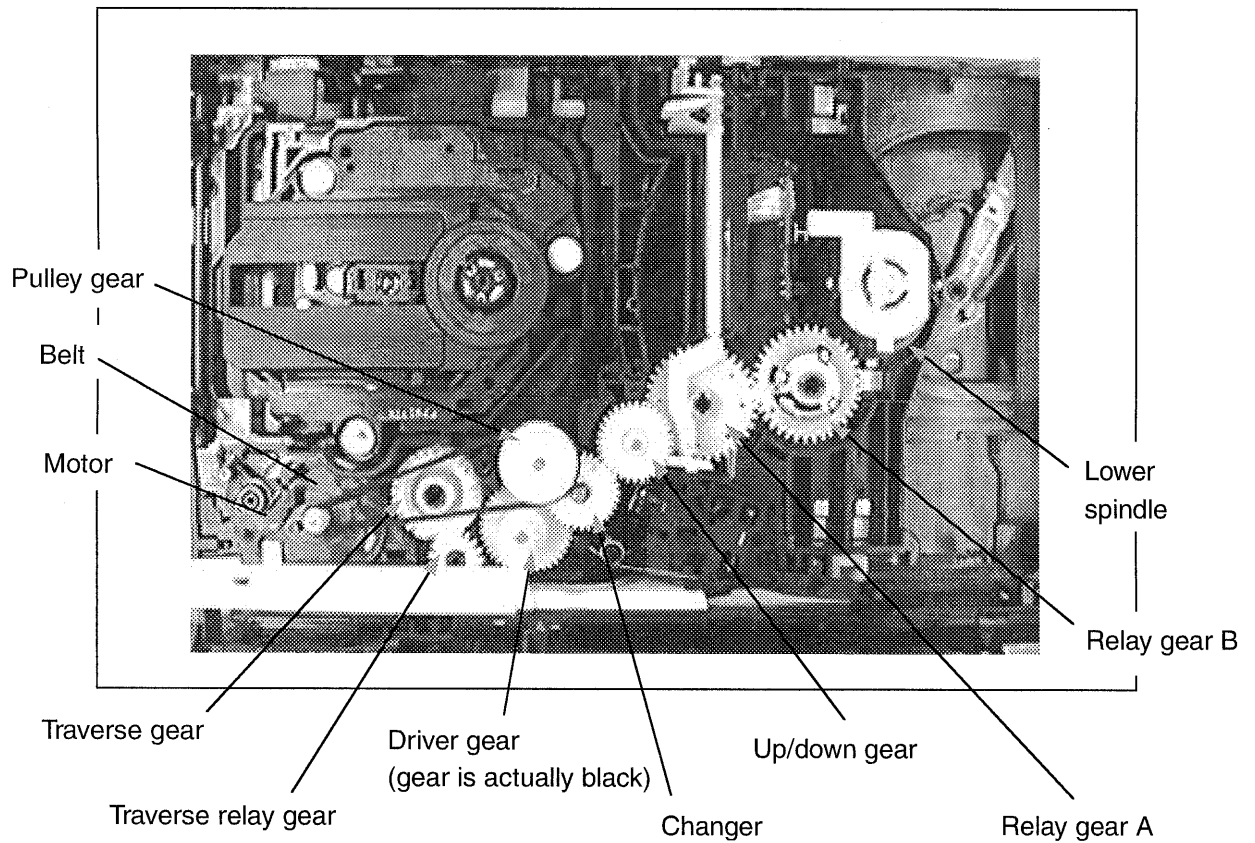
| | Page |
|--|------|
| 1 Mechanism Overview | 3 |
| 2 Mechanism Drive Unit | 5 |
| 3 Detection Switches | 7 |
| 4 Mechanism Operation Description | |
| 4-1 Mechanism Home Position | 9 |
| 4-2 Shipping Position | 9 |
| 4-3 Overview of Mechanism Drive Operation | 9 |
| 5 Mechanism Operation Description | |
| 5-1 Mechanism Initialization | 13 |
| 5-2 Tray Opening Operation | 13 |
| 5-3 Tray Closing Operation | 14 |
| 5-4 Disc Stocking Operation | 15 |
| 5-5 Disc Loading Operation | 17 |
| 5-6 Upward and Downward Movement of the Traverse and the Spindle Base | 18 |
| 5-7 Timing Charts | 20 |
| 6 Disassembly | |
| 6-1 Disassembly of the Traverse Unit | 24 |
| 6-2 Disassembly of the Tray Unit | 26 |
| 6-3 Disassembly of the Mechanism Base | 27 |
| 7 Reassembly | |
| 7-1 Reassembly of the Traverse Unit | 29 |
| 7-2 Reassembly of the Tray Unit | 30 |
| 7-3 Reassembly of the Mechanism Base Drive Unit | 31 |
| 8 About the Gear Tool | 32 |

1 Mechanism Overview

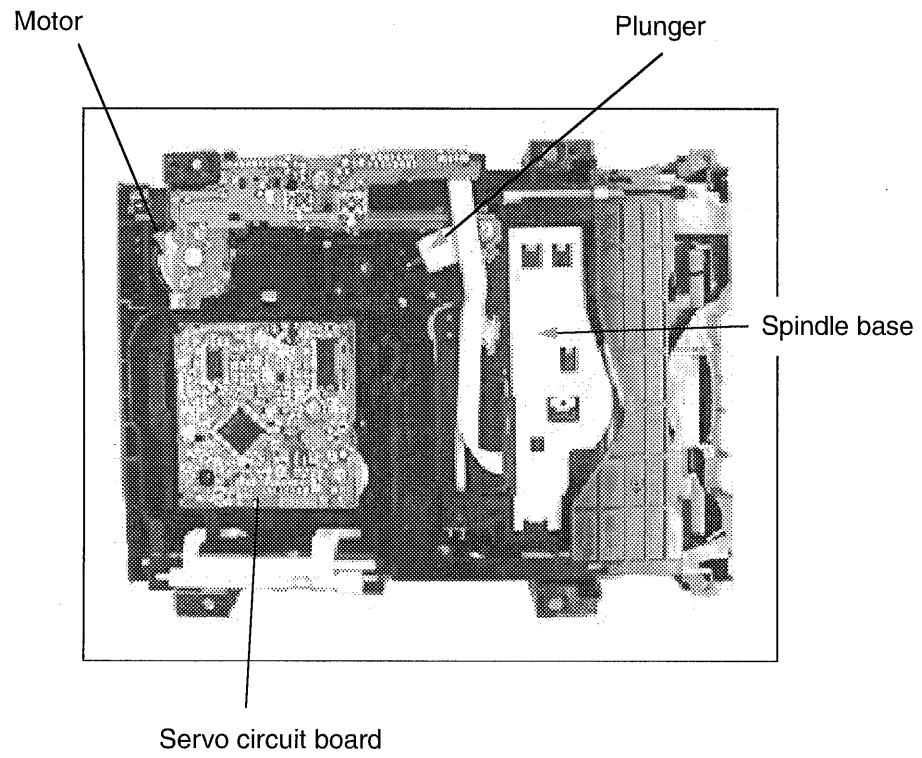


- 1) Disc stocker: Includes the upper spindle, the spindle base (lower spindle), the bottom switch, and the counter switch; stocks the discs in the designated disc numbers and selects the designated disc.
- 2) Mechanism base: Includes the CD changer mechanism drive unit; performs tray opening and closing, transport of the tray to the stocking position and to the traverse position, up/down operation of the traverse, and up/down operation of the spindle base.
Counts the revolutions of the lower spindle, controls stocking of the designated disc, and controls loading height.
- 3) Traverse unit: Includes the traverse mechanism and the servo circuit board; plays the discs.
- 4) CD tray unit: Loads and unloads the discs, transports the discs to the stocking position, and loads the discs into the traverse position.
- 5) Printed circuit board: Includes the loading motor, switch, and plunger; controls mechanism drive; the control microprocessor is located on a printed circuit board in the deck.

2 Mechanism Drive Unit

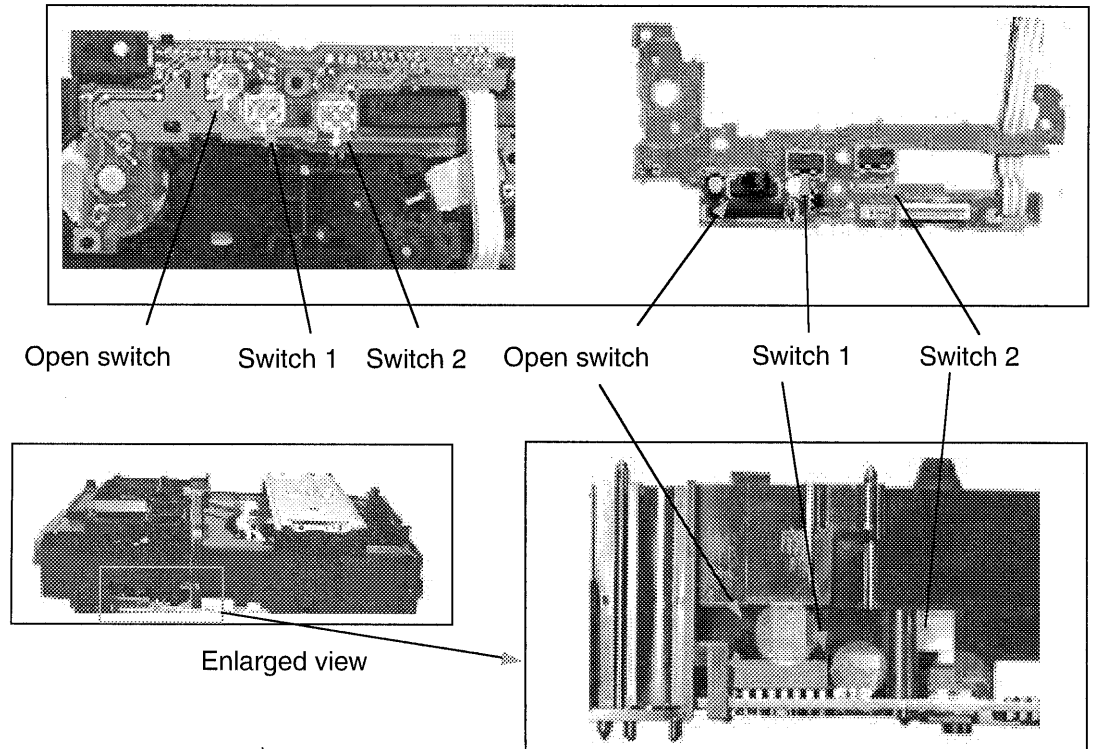


Mechanism bottom view

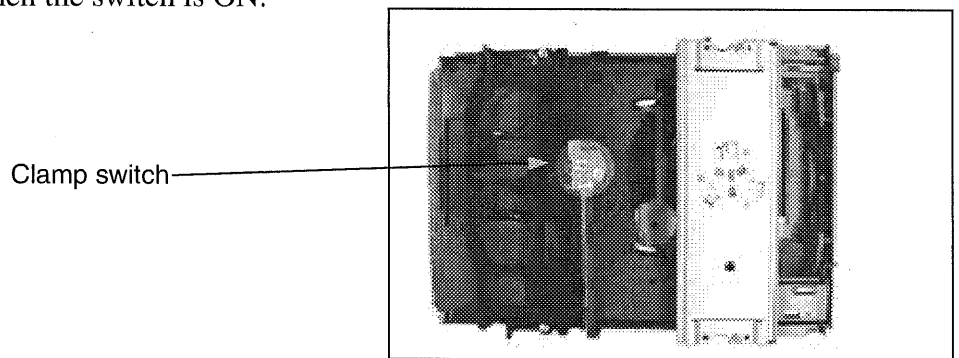


3 Detection switches

- Switch 1: Detects the transition of the tray between the play position, the change position, and the stocking position.
- Switch 2: Detects the transition of the tray between the play position, the change position, and the stocking position.
- Open switch: Detects when the tray is open; tray is open when the switch is ON.

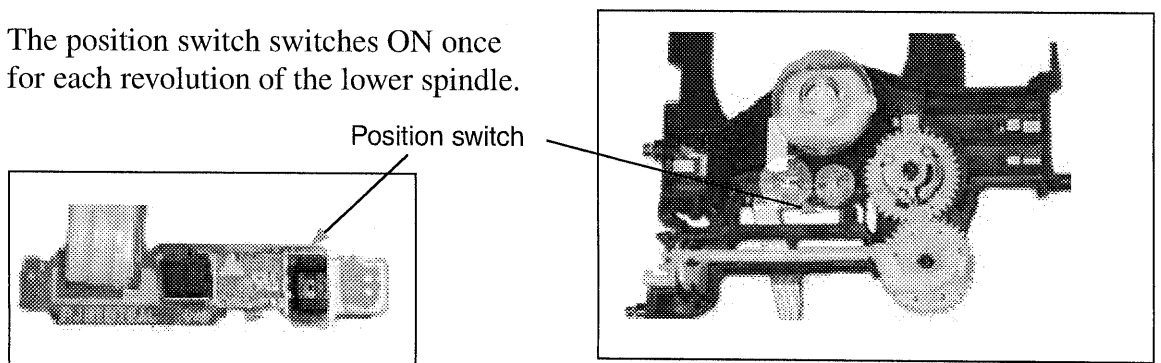


- Clamp switch: Detects a clamping error at the play position; clamping error has occurred when the switch is ON.



- Position switch: Detects vertical position of the disc stoker (stocking and loading position of each disc).

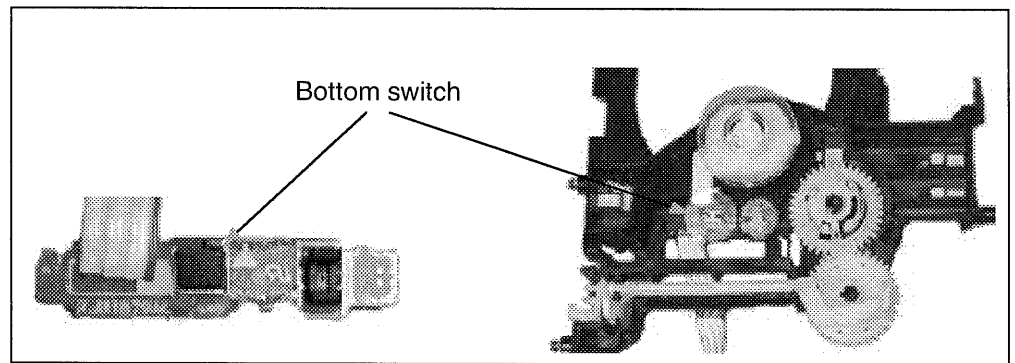
The position switch switches ON once for each revolution of the lower spindle.



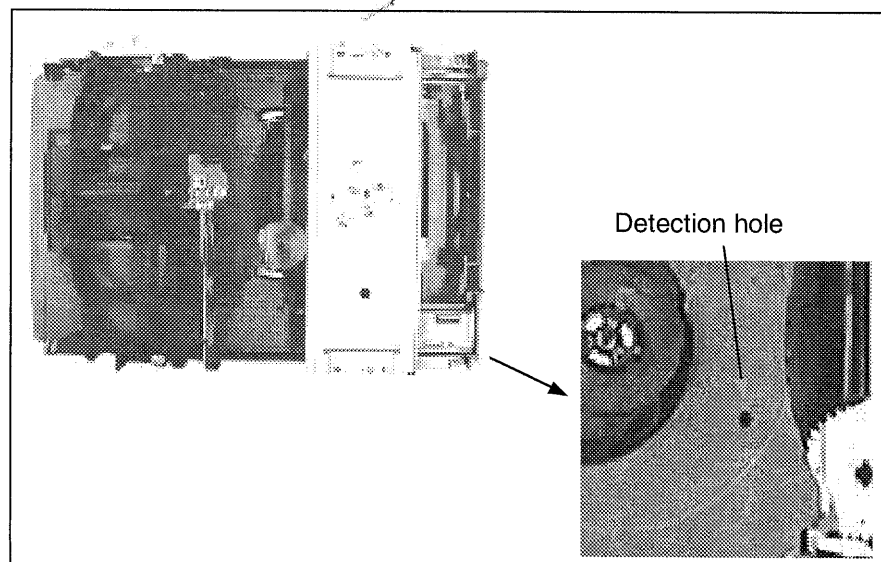
Relationship between disc position and position switch counter

| Disc position | Position switch counter | Bottom switch |
|-----------------------------|-------------------------|---------------|
| DISC 5 STOCK | 6 | OFF |
| DISC 5 LOAD DISC 4 STOCK | 5 | OFF |
| DISC 4 LOAD DISC 3 STOCK | 4 | OFF |
| DISC 3 LOAD DISC 2 STOCK | 3 | OFF |
| DISC 2 LOAD DISC 1 STOCK | 2 | OFF |
| DISC 1 LOAD | 1 | OFF |
| BOTTOM | 0 | ON |

- Bottom switch: Detects the home position of the disc stoker. After the bottom switch detects the vertical home position, the position switch detects the stocking position and loading position for each disc.



- Disc switch: Detects whether or not there is a disc on the traverse. For the SL-HS75, there is a photosensor on the main circuit board (at the top of the mechanism) and an LED beneath the mechanism base, and the photosensor detects whether or not there is a disc on the traverse by detecting the light passing through a detection hole.



4 Mechanism Operation Description

4-1 Mechanism Home Position

The mechanism home position is the play position (with a disc clamped), when switches 1 and 2 are both ON.

4-2 Shipping Position

The changer is shipped with the mechanism at the home position.

4-3 Overview of Mechanism Drive Operation

1) Motor revolution directions and operation

| | | |
|-------------------|--------------------------|------------------------------------|
| Clockwise: | During horizontal drive: | Tray-open direction |
| | During vertical drive: | Downward direction (toward disc 1) |
| Counterclockwise: | During horizontal drive: | Tray-close direction |
| | During vertical drive: | Upward direction (toward disc 5) |

There are two types of motor drive, full drive and half drive, each used at different times during operation of the mechanism. There are two types of motor drive, full drive and half drive, each used at different times during operation of the mechanism.

Full drive: Drive at normal voltage Half drive: Drive at half voltage (for quiet mechanism operation and to prevent overrun when stopping)

- 2) Horizontal drive: Opening and closing of the tray, and loading, unloading, and stocking of discs
- 3) Vertical drive: For disc selection

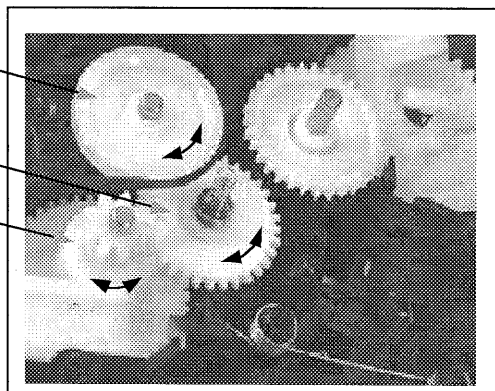
The drive direction changes when the switching ON or OFF of the plunger causes the gears to change.

Horizontal drive: Plunger is OFF.

Pulley gear

Change gear

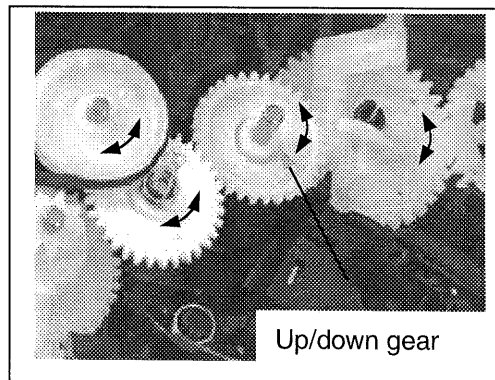
Drive gear



When the plunger is OFF, rotation is transmitted from the pulley gear to the change gear to the drive gear for horizontal drive.

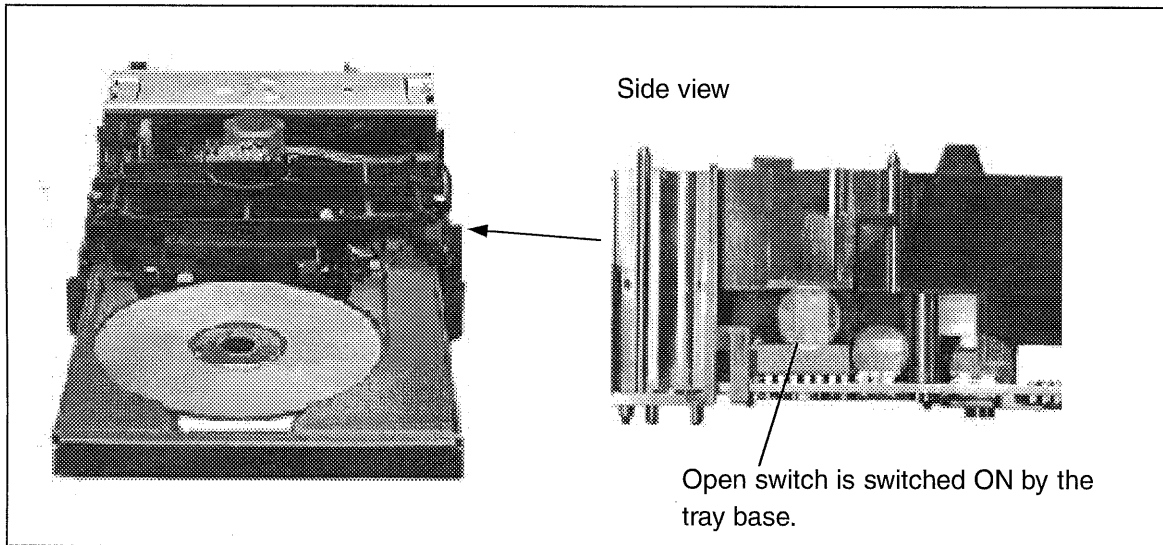
Vertical drive: Plunger is ON.

When the plunger is ON (drawn in), the change gear is pushed upward so that it engages with the up/down gear for vertical drive.

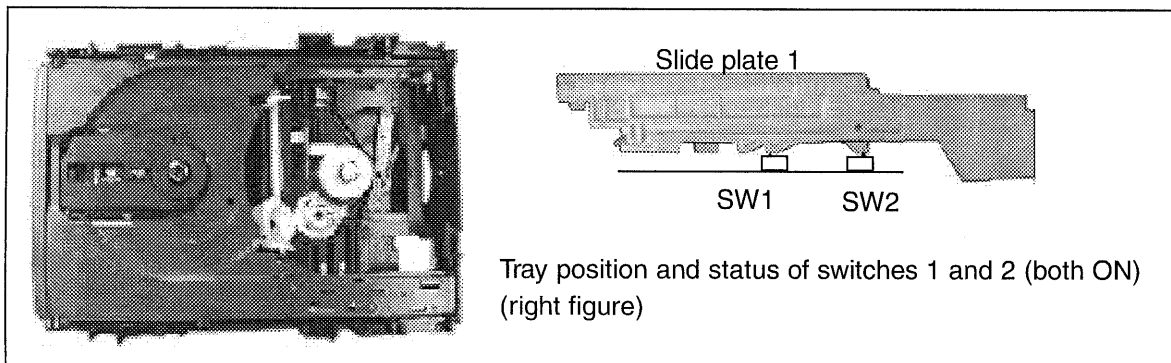


4) Relationship between the tray position and the status of each switch

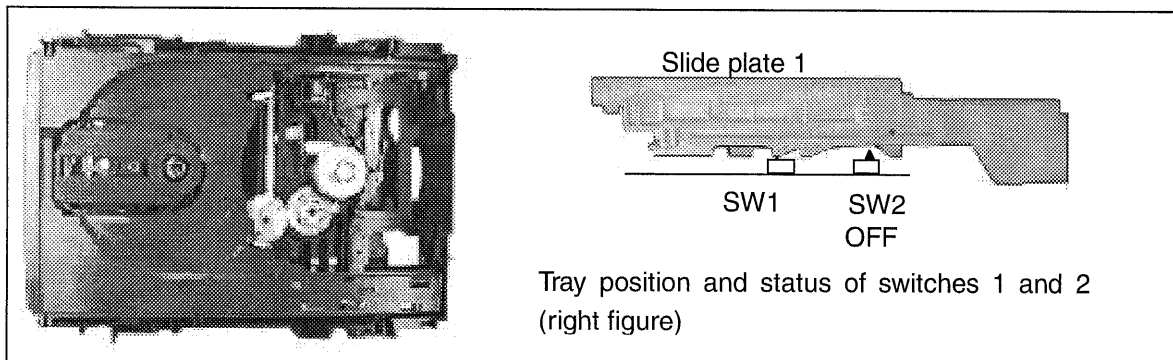
Tray open position: The tray is open and the open switch is ON.



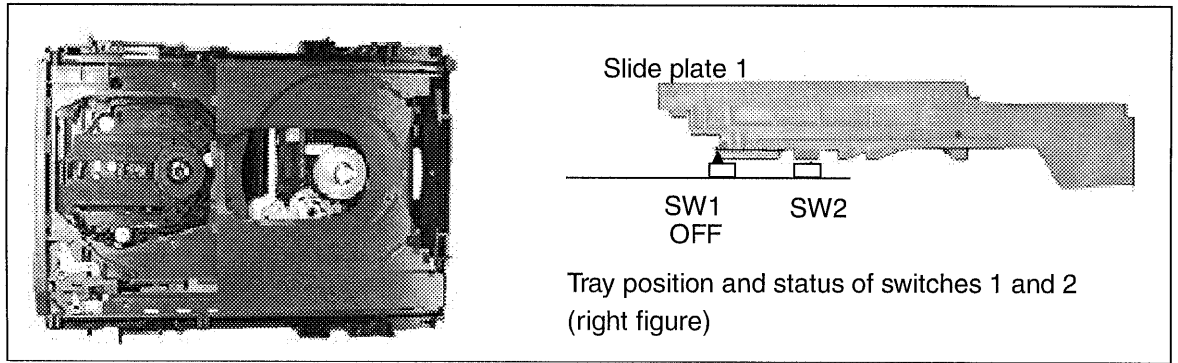
Play position: The tray is in the traverse position and the traverse is clamped.



Change position: The disc stoker is driven up or down.



Stocking position: Disc stocking completed.

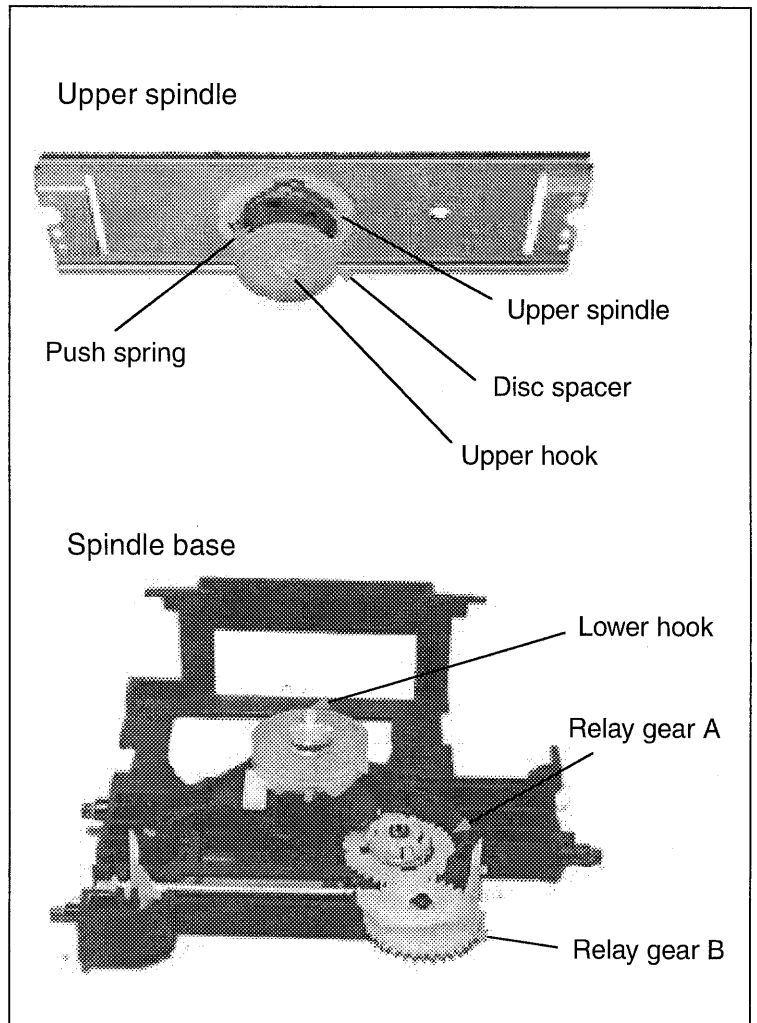


5) Disc selection operation

Selection of the disc to be played is performed by first switching from horizontal drive to vertical drive and then vertically driving the disc stocker to the position (height) of the disc to be played.

Description of disc selection operation

- (1) When the drive direction is switched to vertical, the revolution of the motor is transmitted from the up/down gear to relay gear B to relay gear A and then to the lower spindle.
- (2) The revolution of the lower spindle causes the up/down base to move up or down and move the disc stocker to the position (height) of the disc to be played.
- (3) Next, the drive direction is switched to horizontal, causing the spindle base to move upward and engage with the upper spindle and the upper and lower hooks to be pushed into the spindle, making it possible for the disc spacer to move up and down.
- (4) In this condition, the drive direction switches to vertical and the lower spindle causes the position switch counter to rotate one count for each rotation so that the desired disc is stocked and loaded.

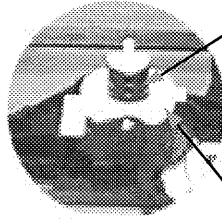


Stock: One count upward

Load: One count downward

(5) The drive direction switches to horizontal and the tray returns to the play position.

Lower spindle with the disc
spacer removed



Revolution of the
spirally grooved lower
spindle cause the
up/down base to move
up and down.

Up/down base

5 Mechanism Operation Description

5-1 Mechanism Initialization

Horizontal drive

When the power is first supplied, because the position of the drive system at that time is unknown, the mechanism moves to the home position (play position).

Next, while in the play position, the disc sensor detects whether or not there is a disc, and the focus and RF signals are also used to confirm whether or not there is a disc.

If there is no disc, the drive direction switches to vertical without the stocking operation being performed.

If there is a disc, the drive direction switches to vertical after the stocking operation is performed.

Vertical drive (disc height initialization)

The mechanism moves to the disc 1 loading position.

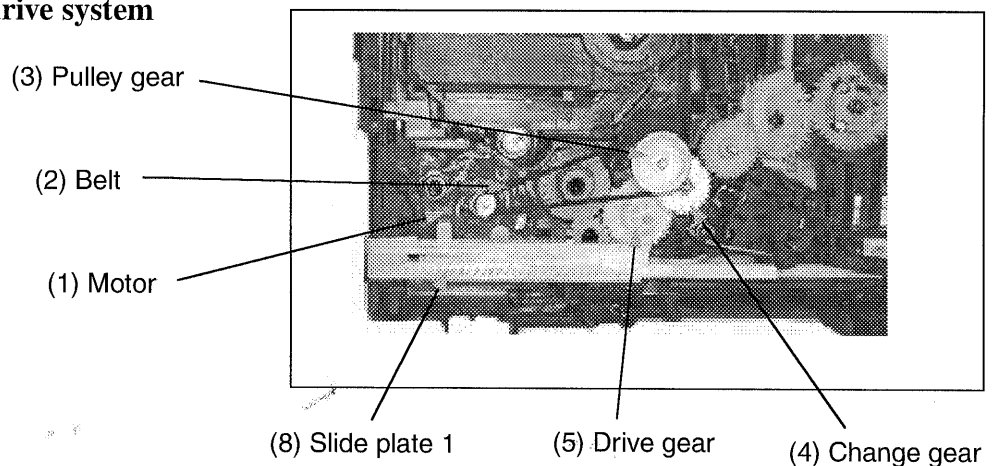
The mechanism moves downward until the bottom switch switches ON. After the bottom position is detected, the mechanism moves upward until the second ON signal of the position switch is detected (disc 2 stocking position), and then it moves horizontally and moves downward to the disc 1 loading position.

5-2 Tray Opening Operation

Horizontal drive

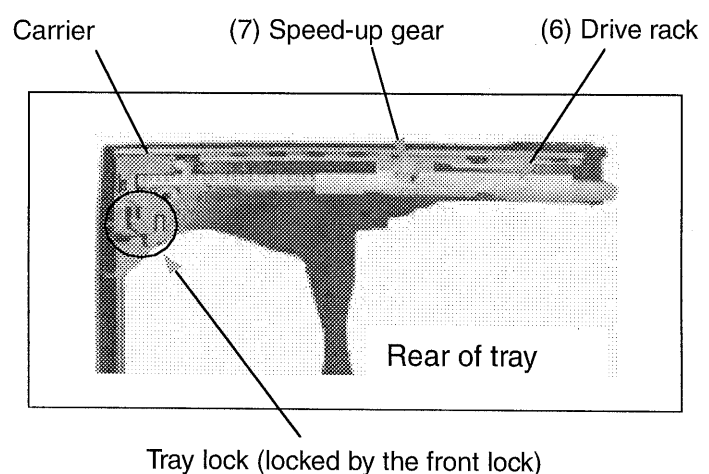
The motor turns in the clockwise direction and stops when the open switch switches ON.

Mechanism drive system

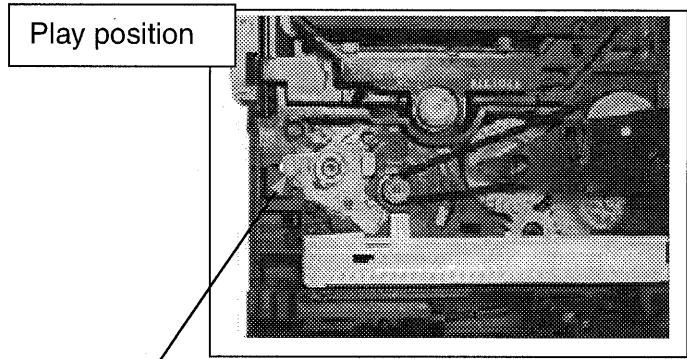


Mechanism operation

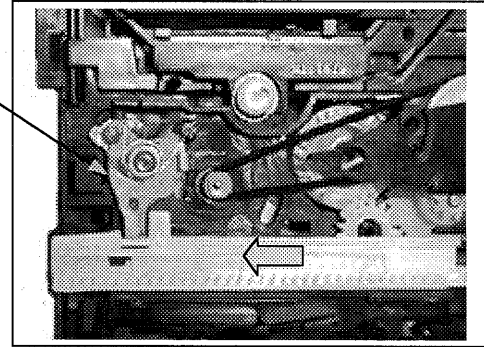
- (1) The motor turns clockwise.
- (2) The belt turns.
- (3) The pulley gear turns.
- (4) The change gear turns counterclockwise.
- (5) The drive gear turns clockwise.
- (6) The tray's drive rack, which is engaged with the drive gear, is driven.
- (7) The drive rack drives the speed-up gear



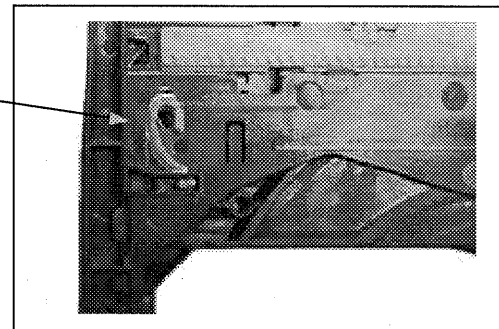
- (8) The tray is locked by the front lock, so the speed-up gear causes slide plate 1 to move toward the front.
- (9) The movement of the slide plate releases the front lock.
- (10) The tray lock is released by the front lock, so the tray opens.



(9) Front lock



Tray is locked when the tip of the front lock enters this opening.

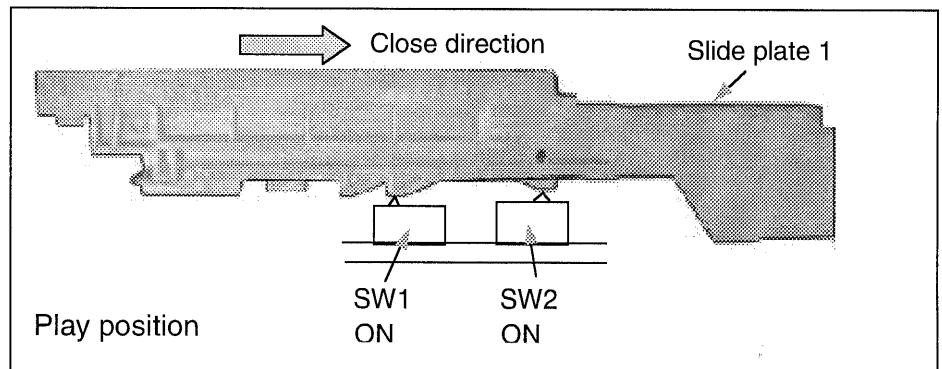


5-3 Tray Closing Operation

Horizontal drive

From the tray-open condition, the motor turns counterclockwise and stops at the point when switches 1 and 2 both switch ON. (The operation of the drive mechanism at this time is the opposite of that for closing of the tray.)

The closing of the tray causes slide plate 1 to move toward the play position.



If the clamp switch switches ON at this time, it is determined that a clamping error has occurred and the tray is opened.

5-4 Disc Stocking Operation

Normally operation continues to the subsequent disc loading operation; the only time that only the disc stocking operation is performed is during mechanism initialization.

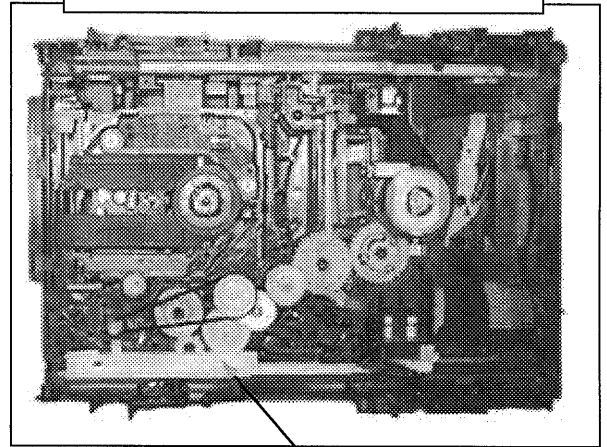
Both horizontal and vertical drive are performed.

First, horizontal drive causes the motor to turn counterclockwise from the play position. When switch 2 switches ON, the motor stops and the plunger is drawn in, and then the drive direction switches to vertical.

Horizontal drive

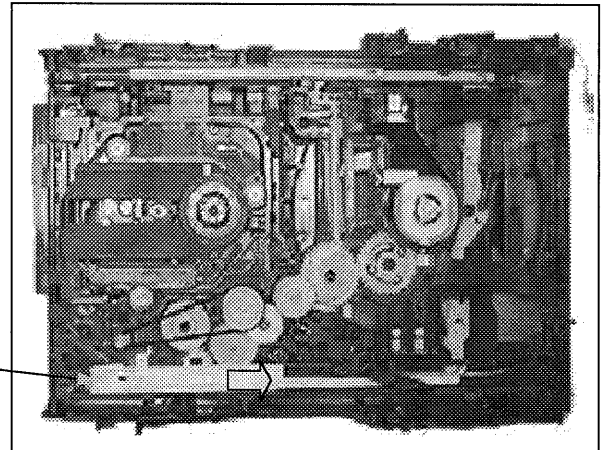
- (1) The motor begins to turn counterclockwise and the rotation is transmitted via the belt, the pulley gear, and the change gear to the drive gear, which then also turns counterclockwise.
- (2) The drive gear drives the tray's drive rack.
- (3) The drive rack drives the speed-up gear.
- (4) Because the tray and the carrier are locked by pins on the traverse chassis, the speed-up gear drives slide plate 1 toward the stocking position.

View with the tray base removed



Slide plate 1 at the play position

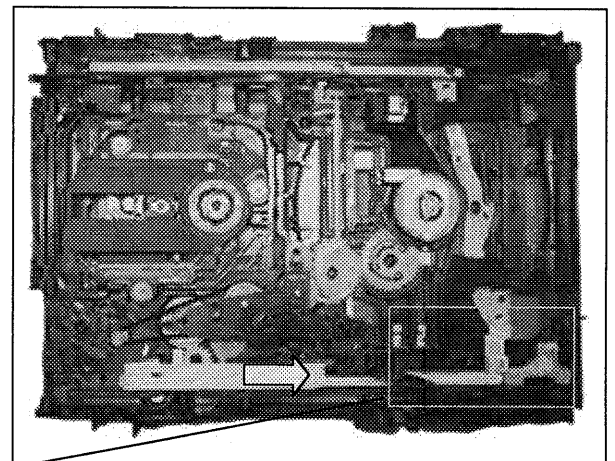
Slide plate 1 at the change position



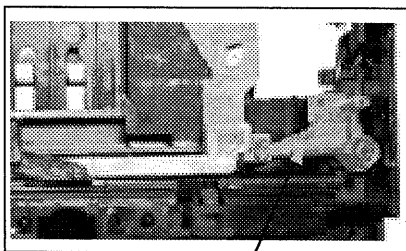
- (5) Slide plate 1 moves toward the stocking position and the traverse begins to move downward.

Slide plate 1 continues to move until it comes in contact with the rear lock, and the traverse moves downward to the lowermost position.

The traverse chassis moves downward and the tray lock is released.



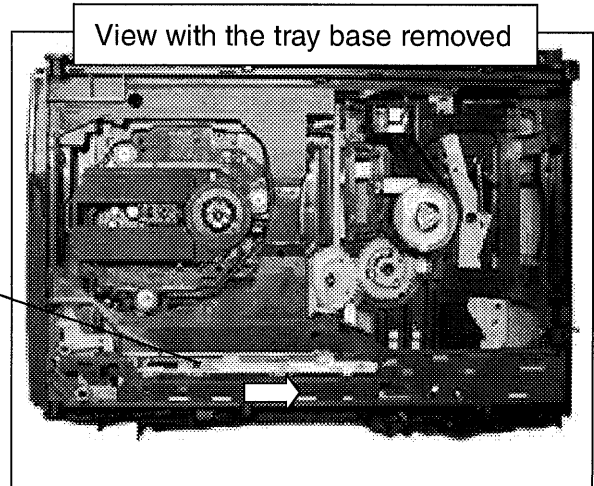
Stocking position
Slide plate 1 is locked by the rear lock.



Rear lock

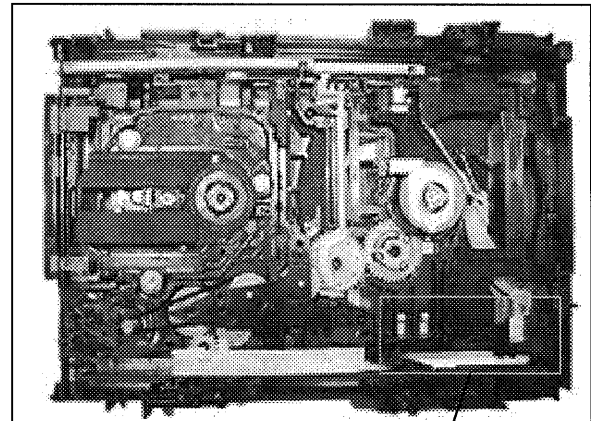
- (6) The tray lock is released, and because slide plate 1 is locked, the tray's carrier begins to move toward the stocking position.

Carrier at the stocking position



- (7) The movement of the carrier to the stocking position releases the rear lock. Slide plate 1 again moves to the stocking position and the spindle unit moves upward.

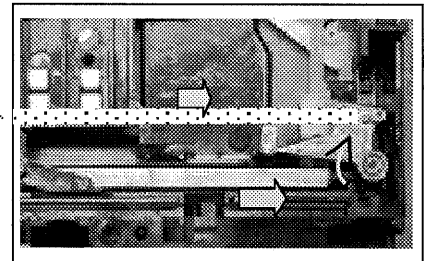
View with the tray base removed



Enlarged view

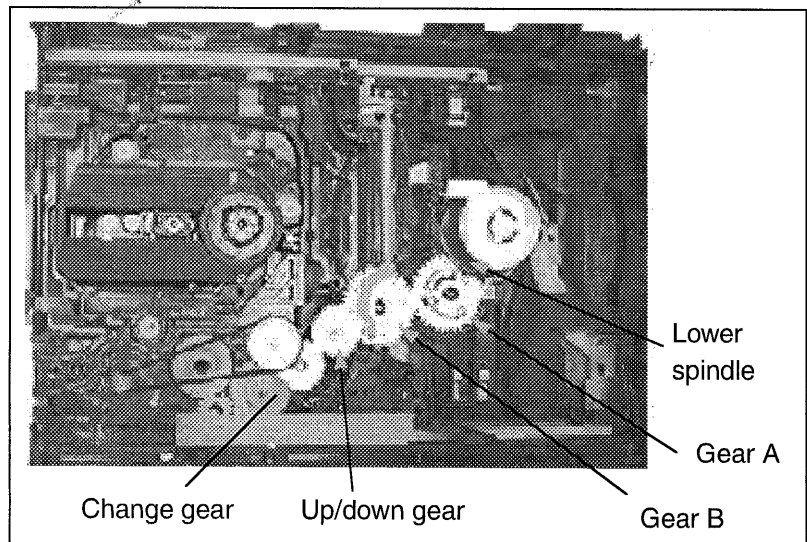
Carrier operating position

The movement of the carrier to the stocking position releases the rear lock, causing slide plate 1 to move again.

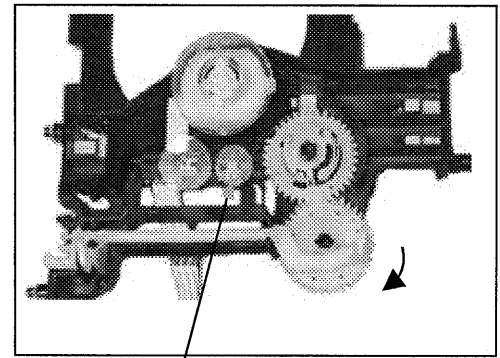


- (8) When slide plate 1 moves to the stocking position, switch 2 switches ON.

- (9) When the switching ON of switch 2 is detected, the motor stops, the plunger is drawn in, and the drive direction switches to vertical.



- (10) When the plunger is drawn in (switches ON), the motor begins to turn counterclockwise (upward direction). The motor then stops when the first ON signal of the position switch is detected.



Position switch

The clockwise rotation of the lower spindle pushes the up/down base upward (1 position for each rotation) and the up/down base in turn pushes both the disc and the disc spacer upward toward the upper spindle. In this condition, when the slide plate moves toward the play position and the spindle base moves downward, the disc is stocked in the upper spindle.

- (11) Next, the plunger switches OFF, the drive direction switches to horizontal, and the motor turns clockwise to move the mechanism to the play position, thus completing the disc stocking operation.

The operation of the mechanism is from the play position to the stocking position and then in the opposite direction.

* Normally operation continues to the subsequent disc loading operation; the only time that only the disc stocking operation is performed is during mechanism initialization.

5-5 Disc Loading Operation

Vertical and horizontal drive

- (1) The plunger is drawn in and the drive direction switches to vertical so that the mechanism moves to the stocked height of the desired disc.
- (2) The motor rotates to the stocked position of the desired disc, the ON signals of the position switch are counted, the motor stops at the stocked position of the desired disc, the plunger switches OFF, and the drive direction switches to horizontal.

Note: Refer to section "4-3-5) Disc selection operation" on page ???.

- (3) Horizontal drive causes the motor to turn counterclockwise from the play position, and when switch 2 switches ON, the motor stops, the plunger is drawn in, and the drive direction switches to vertical.

- (4) Next, the motor turns clockwise for downward movement, and when the first ON signal of the position switch is detected, the motor stops.

Although the motor turned counterclockwise (lower spindle turned clockwise) to move the up/down base upward during the disc stocking operation, during the disc loading operation the motor turns in the opposite direction so that the up/down base moves downward and the disc at the lowermost position of the upper spindle is removed and placed on the tray.

- (5) Once again the plunger switches OFF and the drive direction switches to horizontal.
- (6) The motor turns clockwise and stops at the play position (switches 1 and 2 are both ON).

5-6 Upward and Downward Movement of the Traverse and the Spindle Base

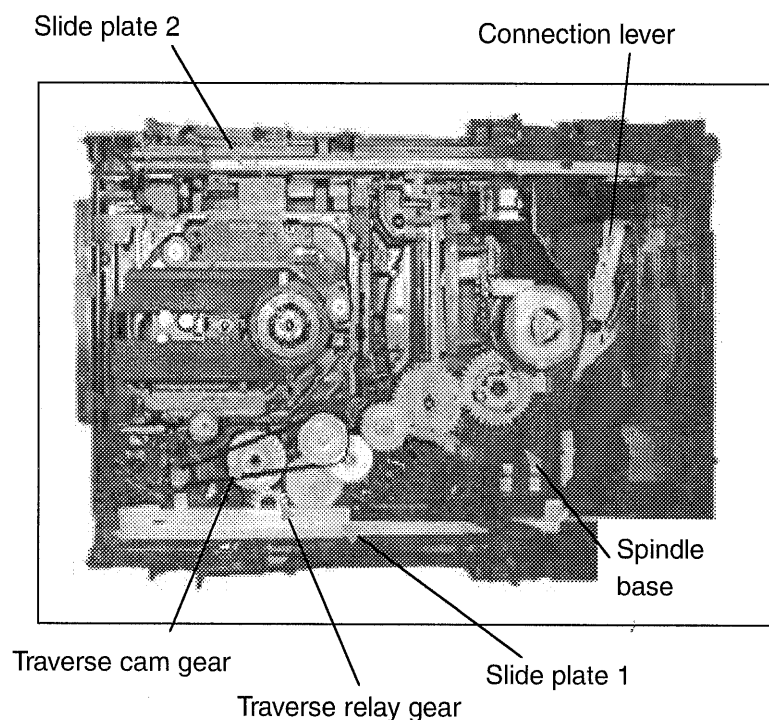
1) Upward movement of the traverse

The upward movement of the traverse is accomplished by the movement of slide plate 2 and the rotation of the traverse relay gear and the traverse cam gear, all of which are linked to the movement of slide plate 1.

When slide plate 1 moves toward the disc stocking position:

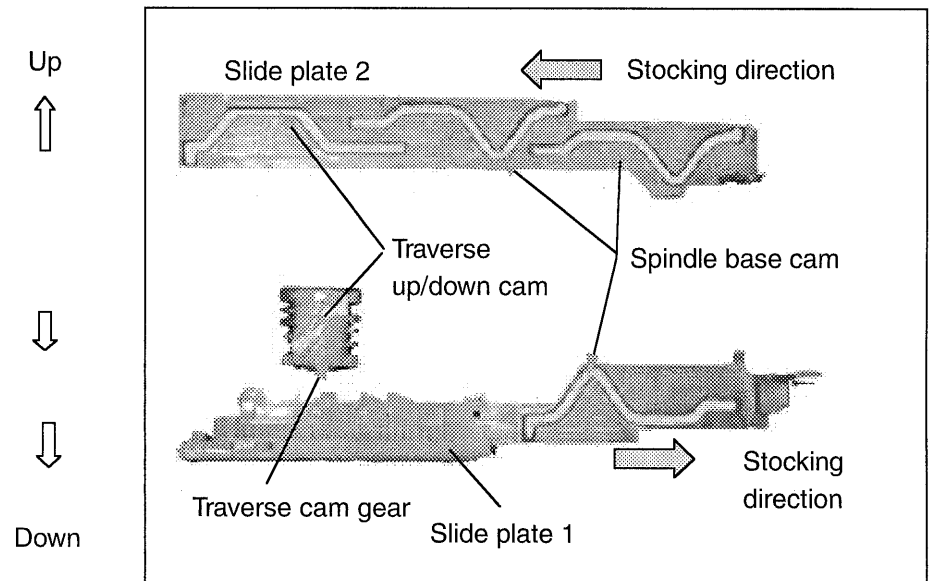
- (1) The traverse relay gear, which is engaged with the rack of slide plate 1, turns counterclockwise and the traverse cam gear turns clockwise.
- (2) Slide plate 2 is moved toward the front via the action of the connection lever.

There are cam grooves in the traverse cam gear and in the slide plates, and the traverse is moved up and down along these grooves.



2) Downward movement of the traverse

The downward movement of the traverse is accomplished by the movement of slide plate 1 and slide plate 2.



5-7 Timing Charts

1) Motor control logic

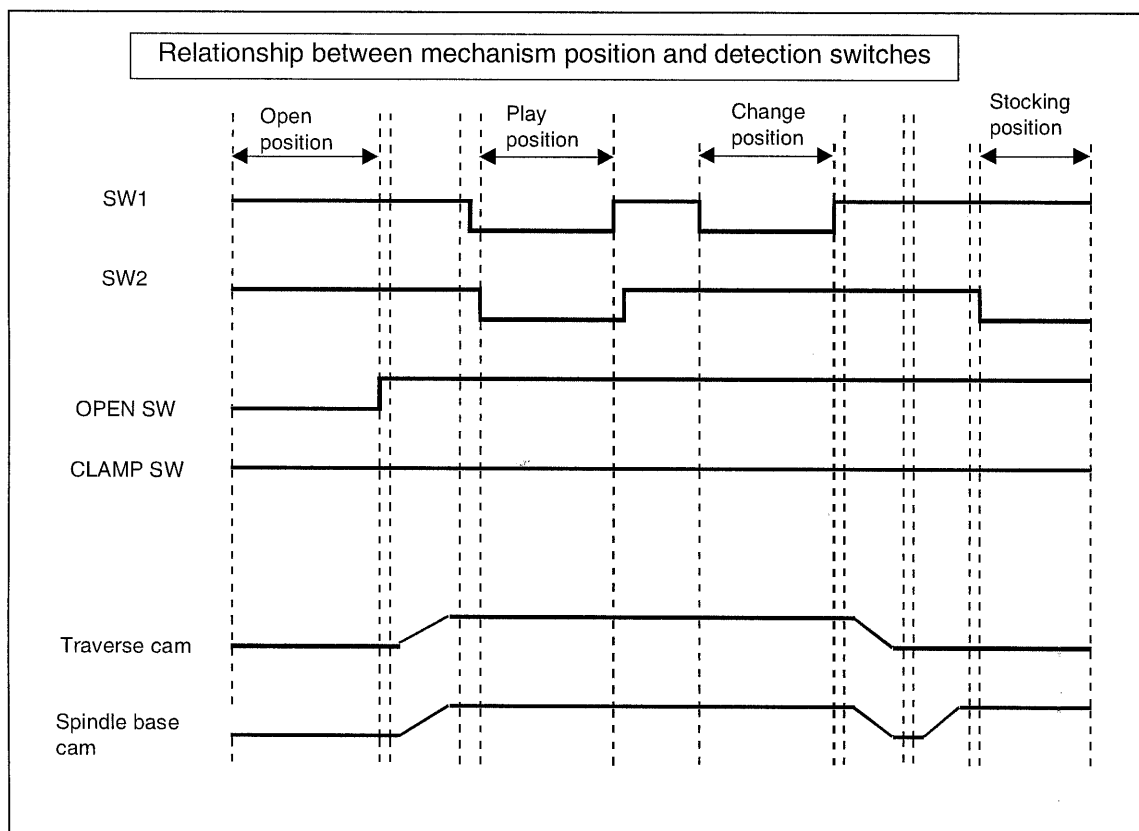
| | CW | CCW | Half drive | Plunger |
|-------------------------|----|-----|------------|---------|
| Horizontal close | L | H | L | L |
| Horizontal open | H | L | L | L |
| Vertical up | L | H | H | H |
| Vertical down | H | L | H | H |
| Release | L | L | H | - |
| Short brake | H | H | H | - |

2) Detection switch and timing chart logic

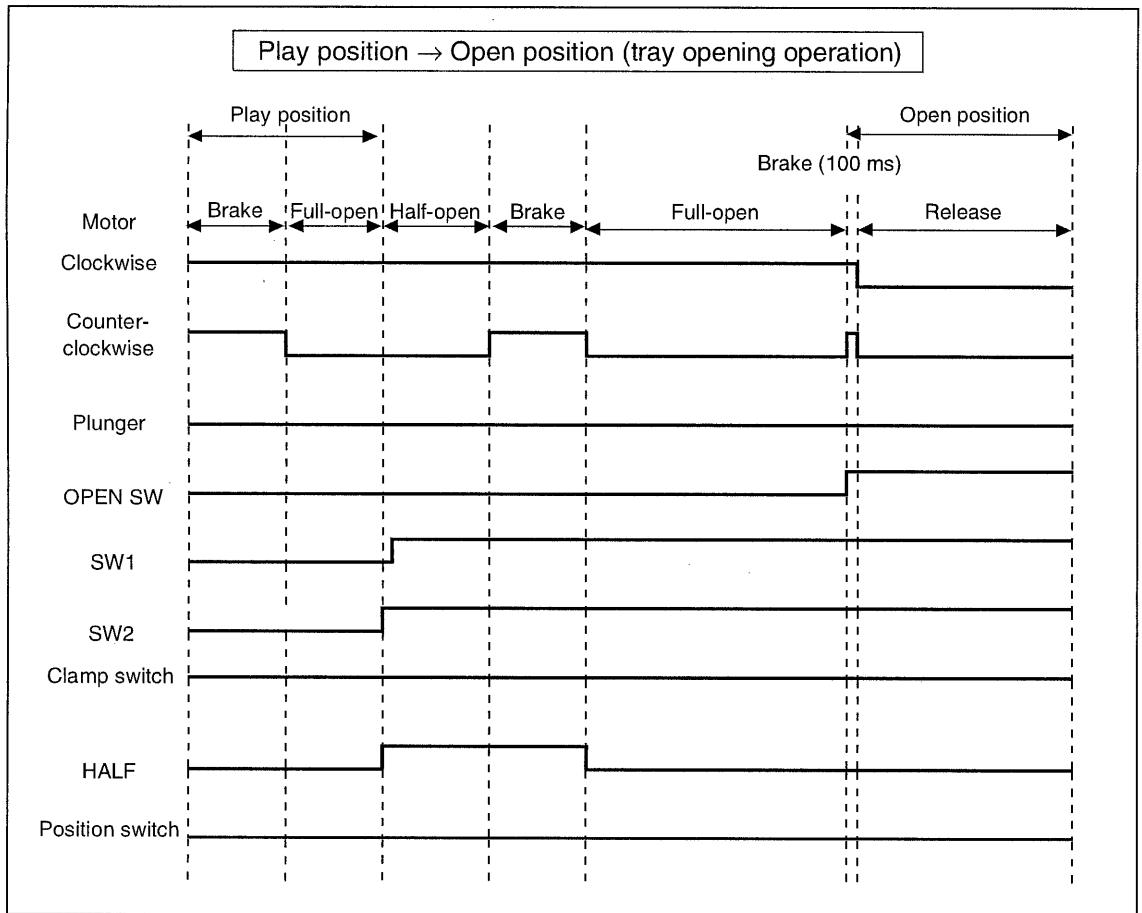
| Detection switch | ON | OFF | Remarks |
|------------------|----|-----|------------------|
| SW 1 | L | H | |
| SW 2 | L | H | |
| OPEN SW | L | H | |
| Clamp switch | L | H | |
| Position switch | L | H | Photointerrupter |
| Bottom switch | L | H | |
| Disc switch | H | L | Photosensor |

3) Timing chart

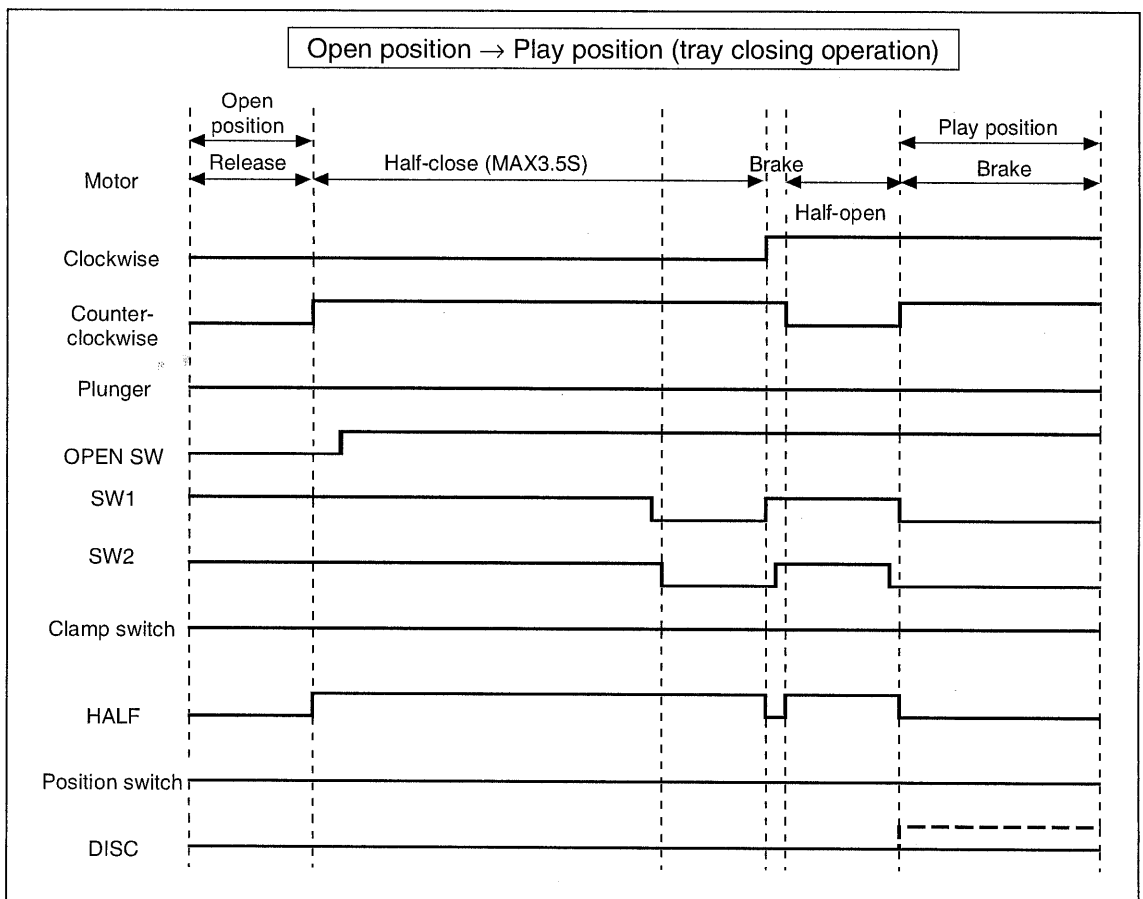
(1) Relationship between mechanism position and detection switches



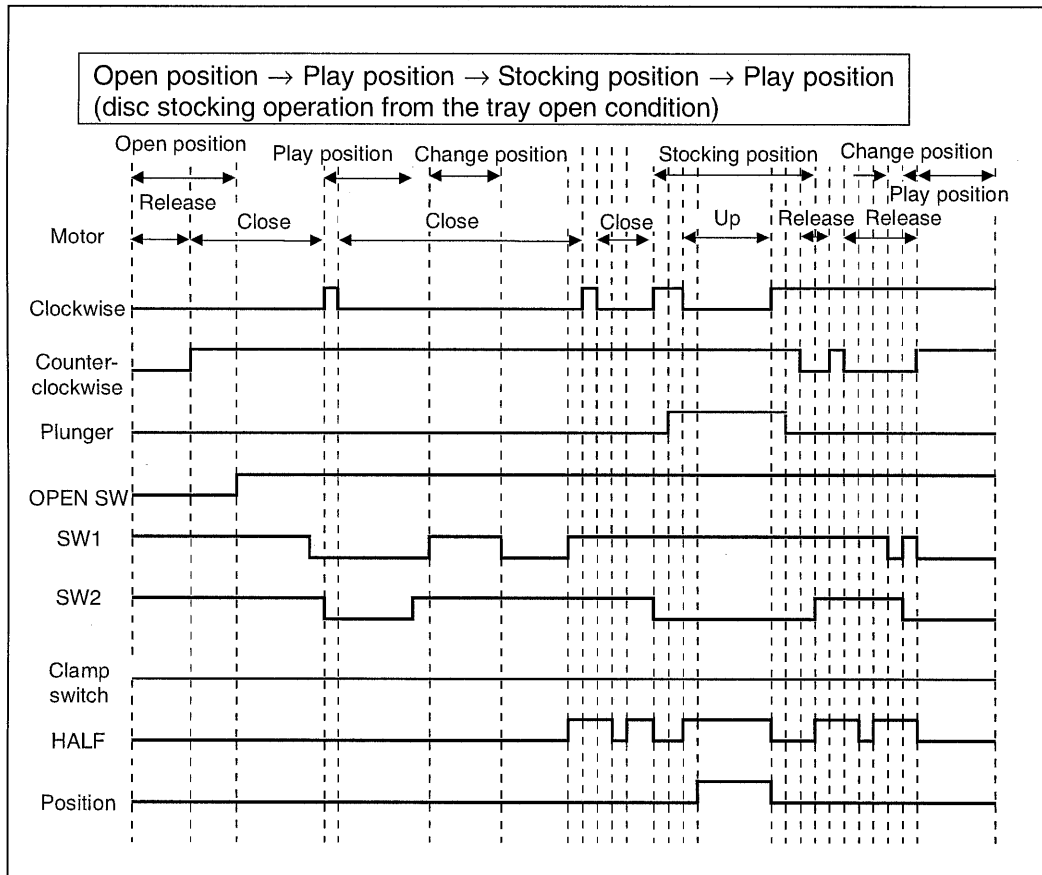
(2) Tray opening operation



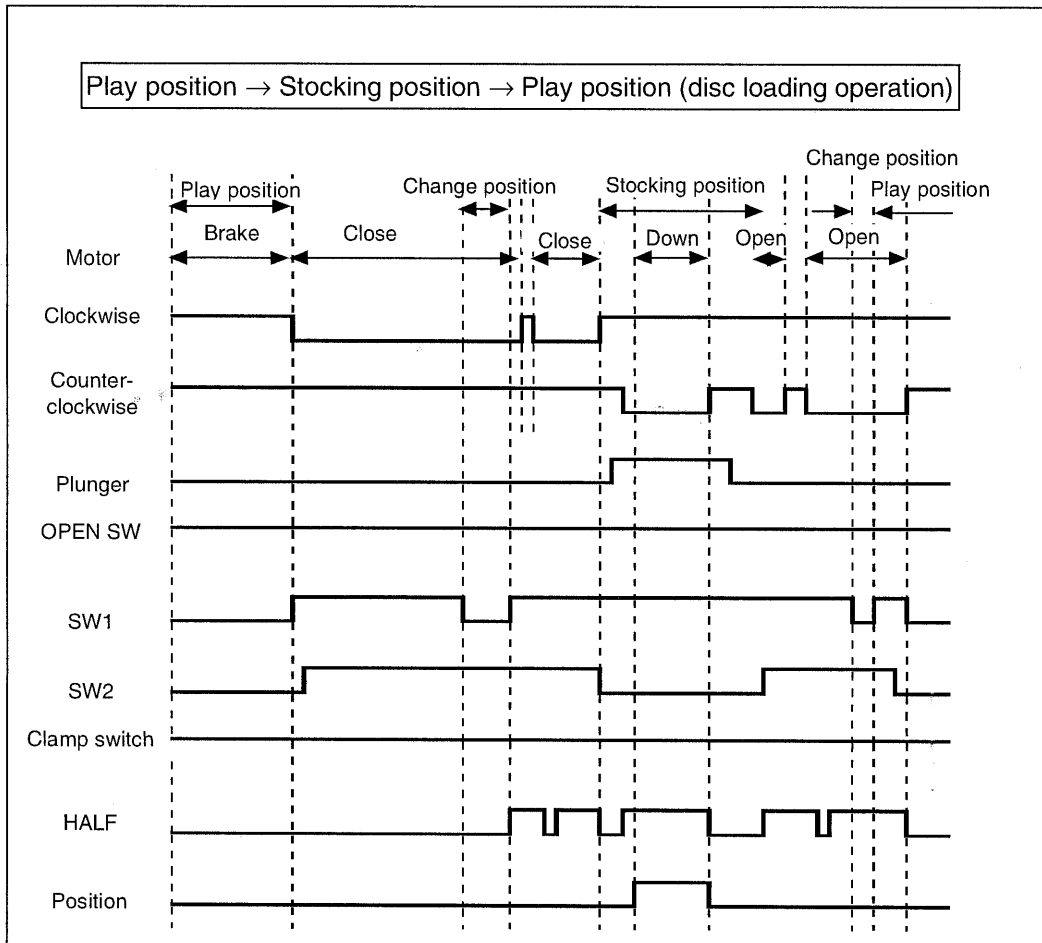
(3) Tray closing operation



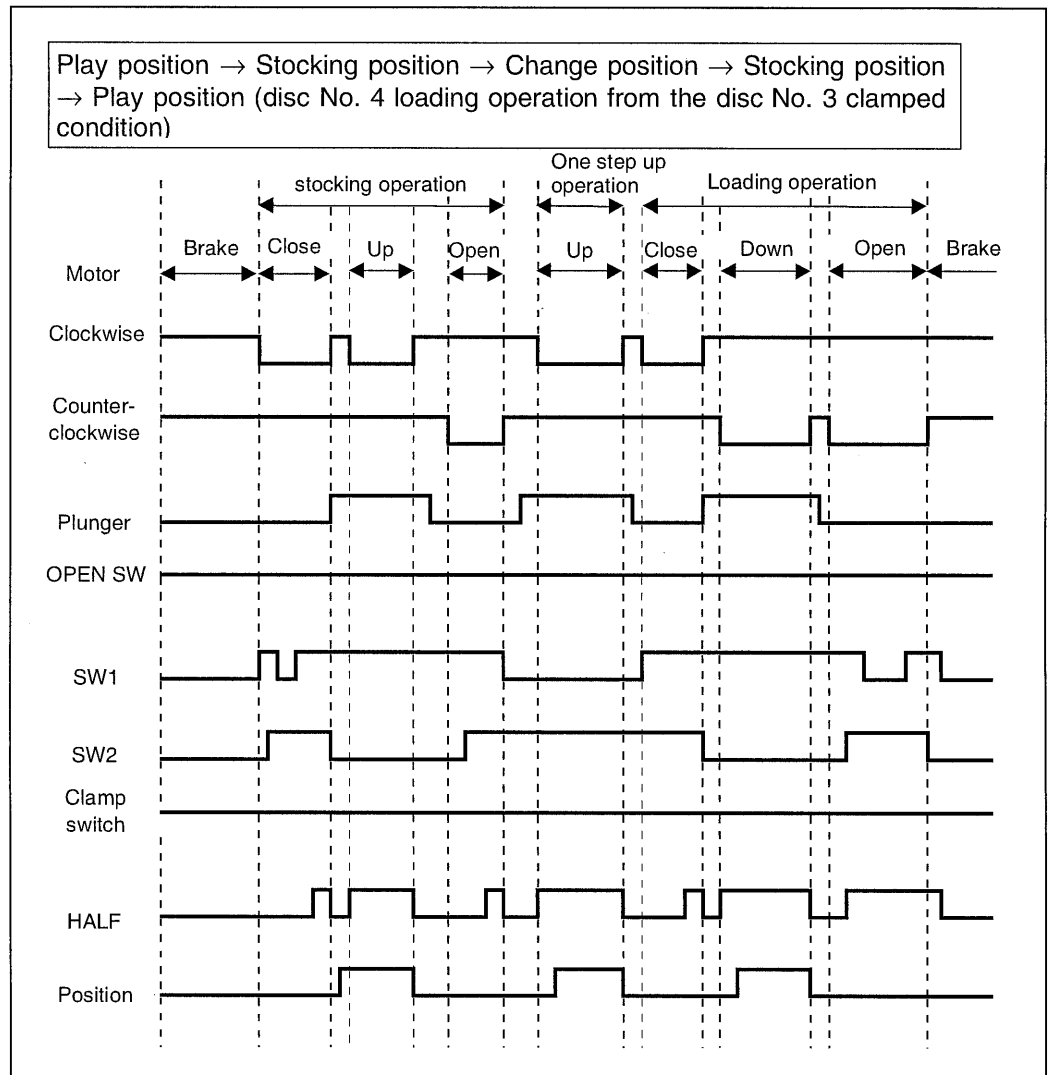
(4) Disc stocking operation



(5) Loading operation



(6) Disc change and play operation from the play position



6 Disassembly

6-1 Disassembly of the Traverse Unit

- 1) Open the tray to the full-open position.

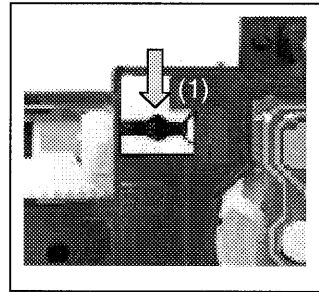
By using the gear tool, this can be accomplished without requiring a power supply. Turn the gear tool as far as it will go in the clockwise direction as seen from the underside of the mechanism.

(For more detailed information, refer to section "8 About the Gear Tool" on page ???.)

- 2) With the mechanism turned upside down, disengage the end stopper of slide plate 1, and then move slide plate 1 further toward the front.
- 3) With the slide plate 1 in the condition described above, disengage the end stopper of slide plate 2, and then push slide plate 2 toward the rear and disengage the hook.

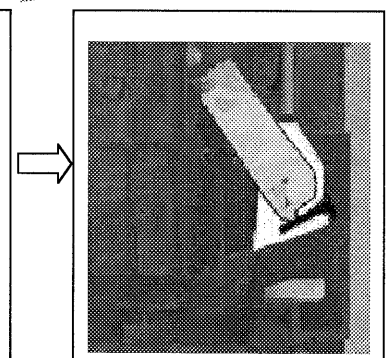
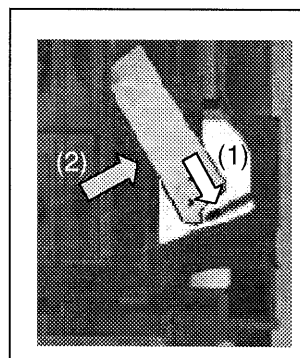
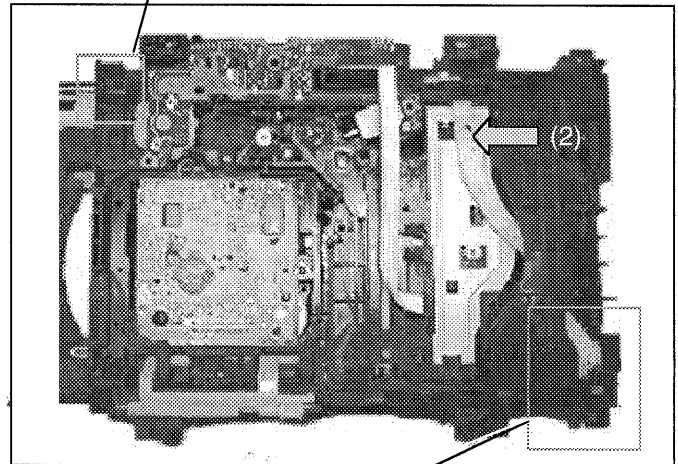
Slide plate 1

- (1) While pressing down on the top of the end stopper (black boss),
- (2) Push slide plate 1 from the rear and disengage the stopper.

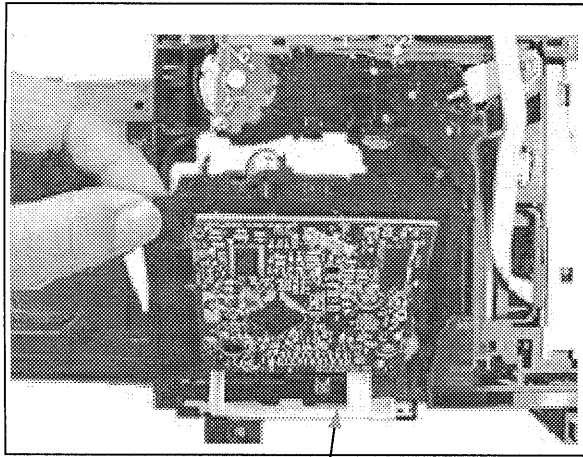


Slide plate 2

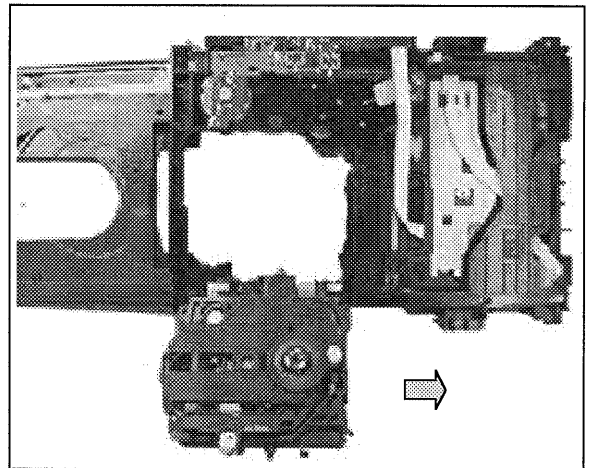
- (1) With the slide plate 1 in the condition described above, while pushing the end stopper of slide plate 2,
- (2) Push slide plate 2 toward the rear and disengage the stopper hook.



- 4) Lift up the traverse chassis mechanism from the bottom and disengage it from the timing lever.

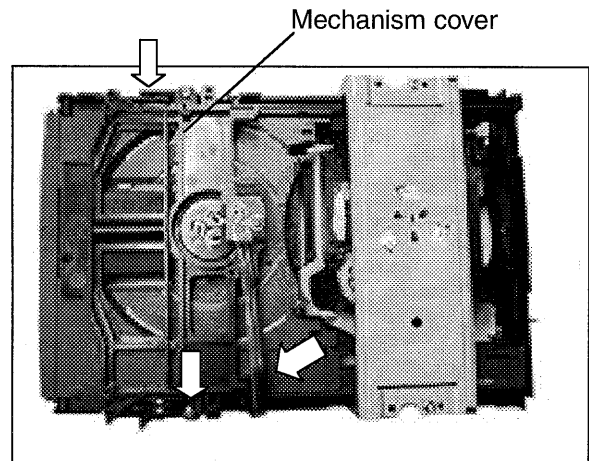


Timing lever



6-2 Disassembly of the Tray Unit

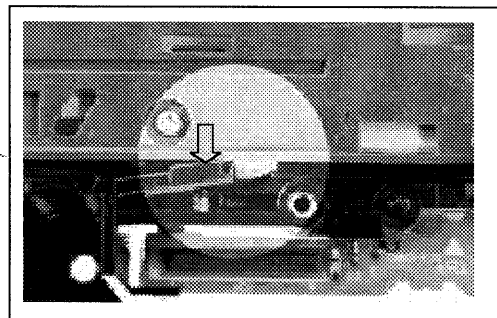
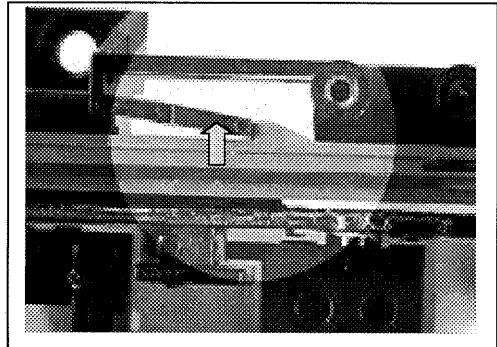
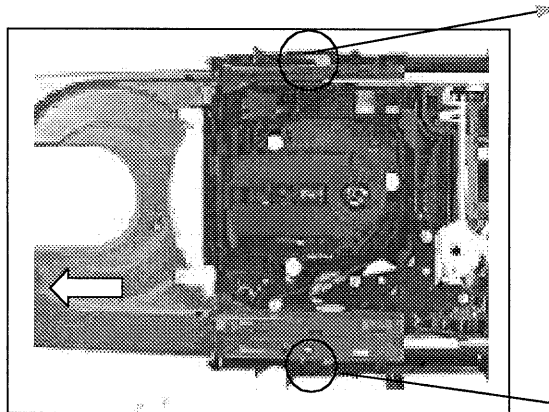
- 1) Remove the attachment for the A unit wiring.
- 2) Remove the two screws to remove the mechanism cover.



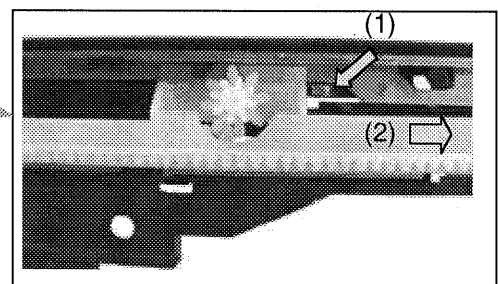
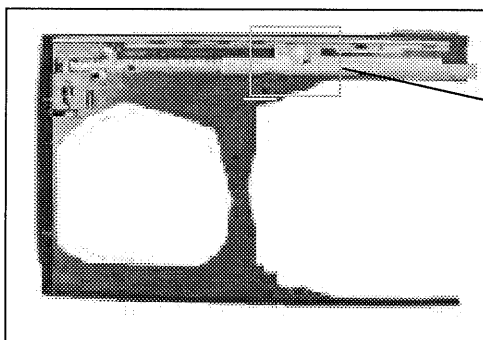
- 3) Open the tray to the full-open position.

By using the gear tool, this can be accomplished without requiring a power supply. Turn the gear tool as far as it will go in the clockwise direction as seen from the underside of the mechanism.
(For more detailed information, refer to section "8 About the Gear Tool" on page ???.)

- 4) Disengage the mechanism base stopper hooks and slide out the tray base. (Be careful that the tray base does not get caught on the uneven surfaces of the left die side core.)



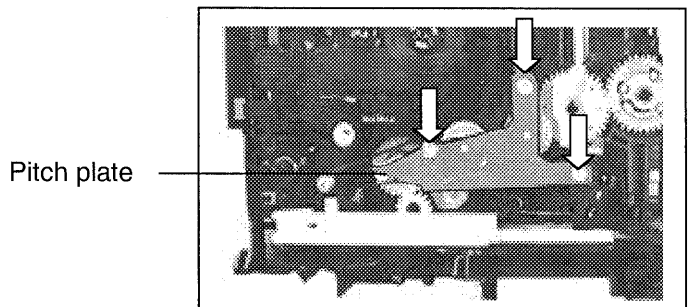
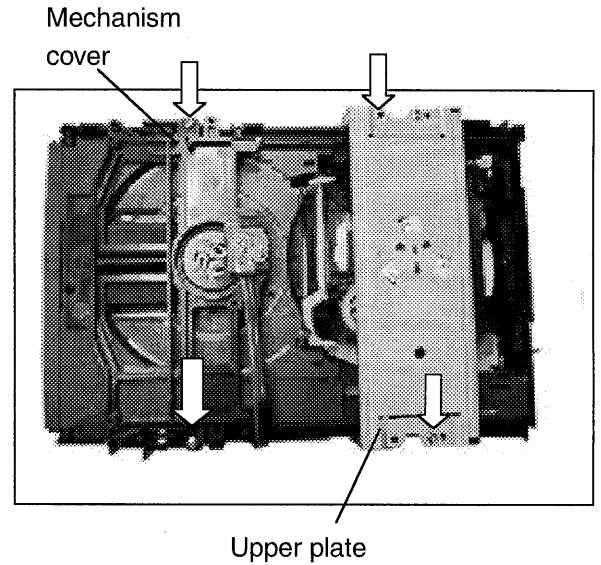
To remove the drive rack, press the stopper on the rack base.



6-3 Disassembly of the Mechanism Base

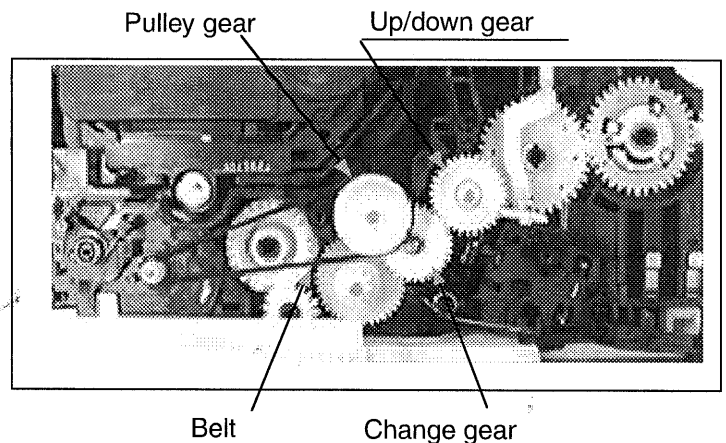
Caution: If the disassembly is going to proceed as far as the removal of the traverse cam gear and slide plate 2, first remove the traverse unit.

- 1) Remove the two screws (2.6x8) of the mechanism cover and the two screws (2.6x8) of the upper plate to remove the mechanism cover and the upper plate.
- 2) Remove the tray base.
(Refer to section "6-2 Disassembly of the Tray Unit".)
- 3) Remove the three screws (2.6x8) of the pitch plate to remove the pitch plate.

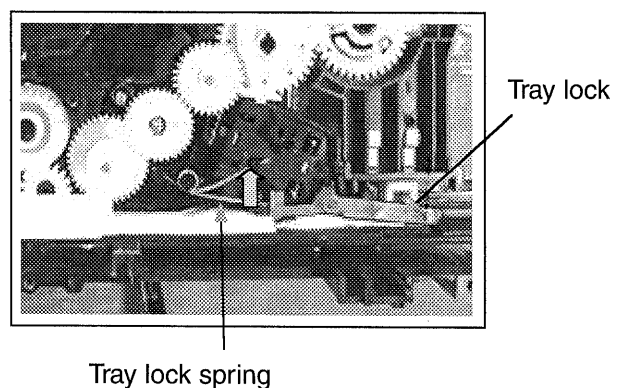


- 4) It is now possible to remove the belt, the pulley gear, the change gear, and the up/down gear.

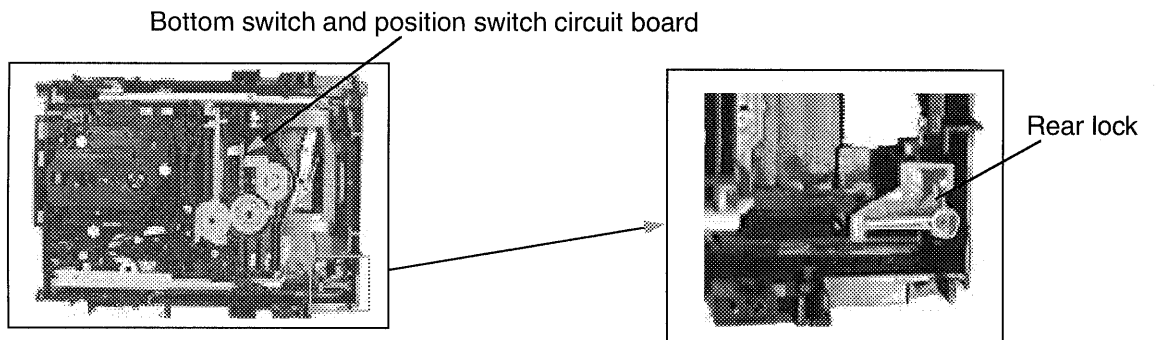
Caution: The change gear has a change spring; be careful not to loose it.



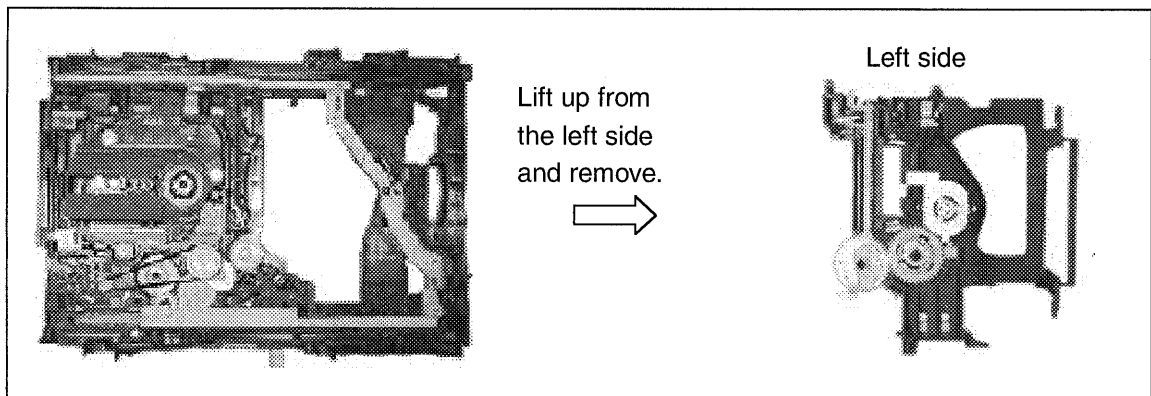
- 5) Disengage the tray lock spring (hook it onto the mechanism base) and remove the tray lock.



- 6) Remove the rear lock.



- 7) Remove the bottom switch and position switch circuit board located on the underside of the mechanism base by spreading apart the two hooks on each side of the circuit board.
- 8) Move slide plate 1 as far as it will go toward the stocking position and remove the spindle base unit.



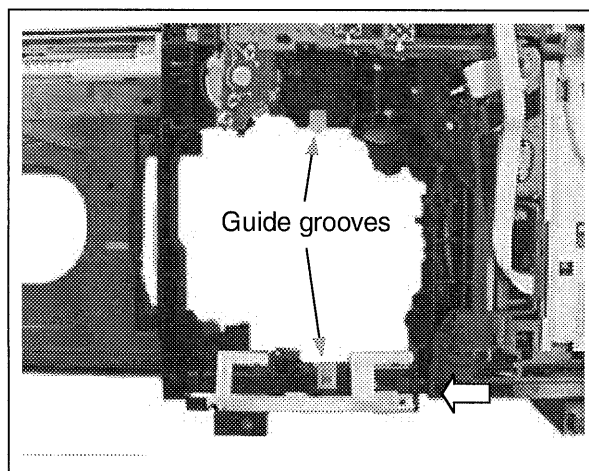
- 9) Lift up on the front end of slide plate 1 and disengage it from the connection lever.
- 10) Remove the drive gear, the traverse relay gear, and the traverse cam gear.
- 11) Remove the pulley gear, the change gear, and the drive gear.
- 12) Remove slide plate 2.

7 Reassembly

7-1 Reassembly of the Traverse Unit

The assembly procedure is the reverse of the disassembly procedure.

- 1) Begin from where the traverse chassis was removed in the disassembly procedure (tray full-open position: with the end stopper hooks of slide plate 1 and slide plate 2 disengaged)
- 2) Mount the traverse chassis and the timing lever.
- 3) Together with the timing lever, fit the pins on the traverse chassis into the guide grooves in slide plate 2 and the traverse cam gear.

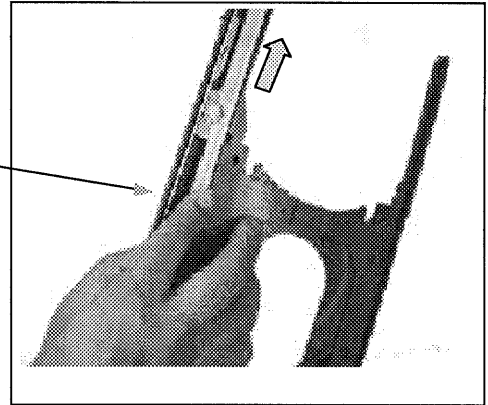


- 4) Push slide plate 1 slightly toward the rear until it engages the end stopper.
- 5) Turn the gear tool counterclockwise to set the traverse to the play position.

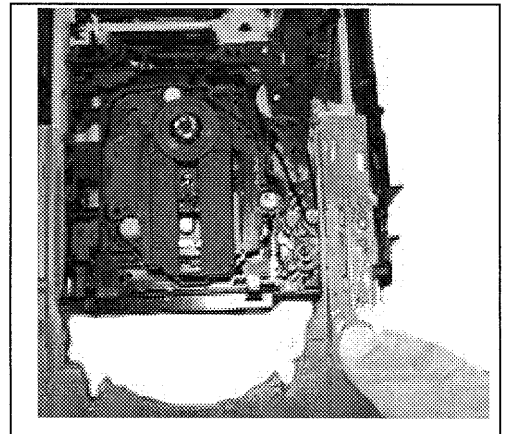
7-2 Reassembly of the Tray Unit

- 1) Slide the drive rack of the assembled tray base as far toward the rear as it will go and then hold it with your finger so it won't move.

Hold with
your finger.

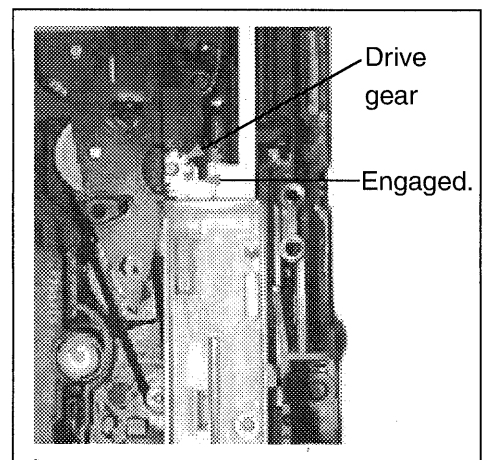


- 2) While holding the drive rack as described above, insert the tray base into the mechanism base.

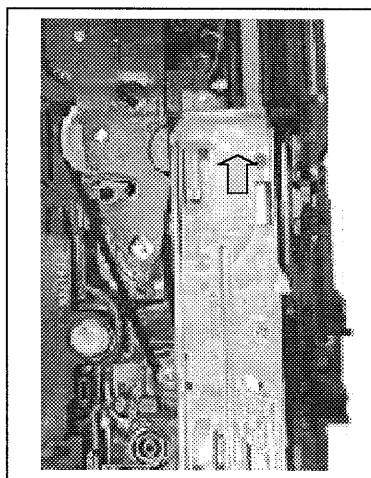


- 3) From the position at which the drive gear engages the drive rack, while continuing to hold the drive rack as described above, insert the tray base while engaging the drive gear with the drive rack.

Caution: When doing this, be careful that the drive rack does not move. The drive gear will rotate as it engages the rack.



Position at which the drive gear engages the drive rack



Position at which the tray base can be inserted no further

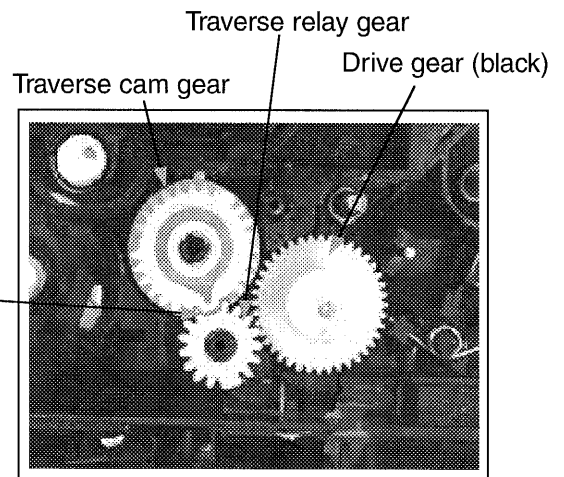
- 4) Stop inserting the tray base at the position at which it can be inserted no further, and then use the gear tool to move the tray base to the play position.

7-3 Reassembly of the Mechanism Base Drive Unit

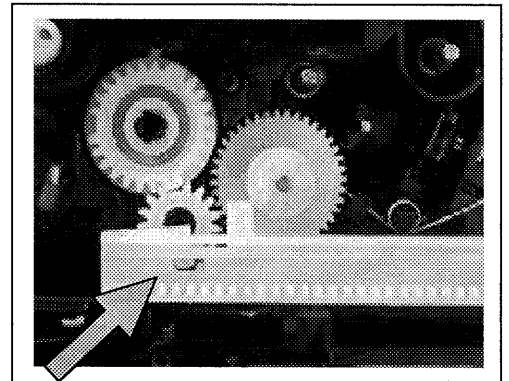
Caution: Reassemble the mechanism base drive unit with the traverse unit removed.

- 1) With slide plate 2 moved forward, mount it to the mechanism base and engage it with the connection lever.
- 2) Move slide plate 2 as far toward the front as it will go.
- 3) Place the drive gear, the change gear, and the pulley gear on their shafts.
- 4) Place the traverse cam gear on its shaft and turn it clockwise until it stops.
- 5) Place the traverse relay gear on its shaft while aligning the trapezoidal gear teeth as shown in the figure at right.

Align the
trapezoidal
gear teeth.



- 6) In this condition, mount slide plate 1.
First engage the end of the plate with the connection lever and then align the position of the plate with the trapezoidal teeth on the traverse relay gear.



- 7) Mount the spindle base unit, beginning from the slide plate 1 side.
- 8) Move slide plate 1 as far toward the front as it will go.
- 9) Mount the rear lock and the tray lock and then mount the spring for each.
- 10) Attach the belt to the pulley gear and the motor pulley.
- 11) Place the up/down gear on its shaft.
- 12) Mount the change spring onto the change gear and then mount the pitch plate and secure it with the three screws (2.6x8).
- 13) Mount the traverse unit. (Refer to section "7-1 Reassembly of the Traverse Unit".)
- 14) Mount the bottom switch and position switch circuit board onto the spindle base unit and secure it between the two hooks.
- 15) Mount the tray base. (Refer to section "7-2 Reassembly of the Tray Unit".)
- 16) Mount the mechanism cover (two 2.6x8 screws) and the upper spindle unit (two 2.6x8 screws).

Operation check following completion of reassembly

The opening of the tray, the movement of the tray to the disc stocking position, and the upward and downward movement of the traverse and the spindle base can be confirmed by turning the gear tool.

8 About the Gear Tool

(Tool used to open and close the tray and to move the tray to the disc stocking position, and to confirm the upward and downward movement of the traverse and the spindle base)

Purpose

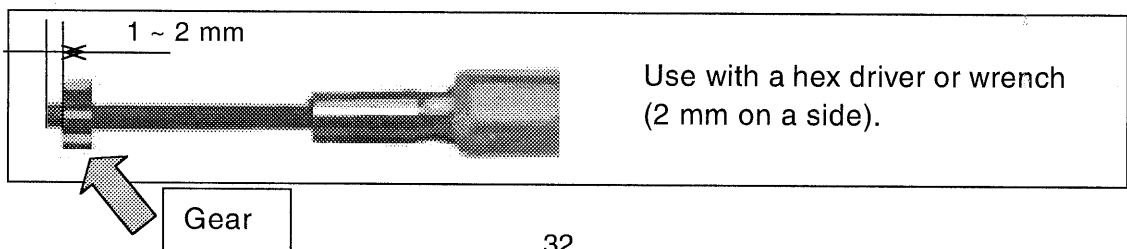
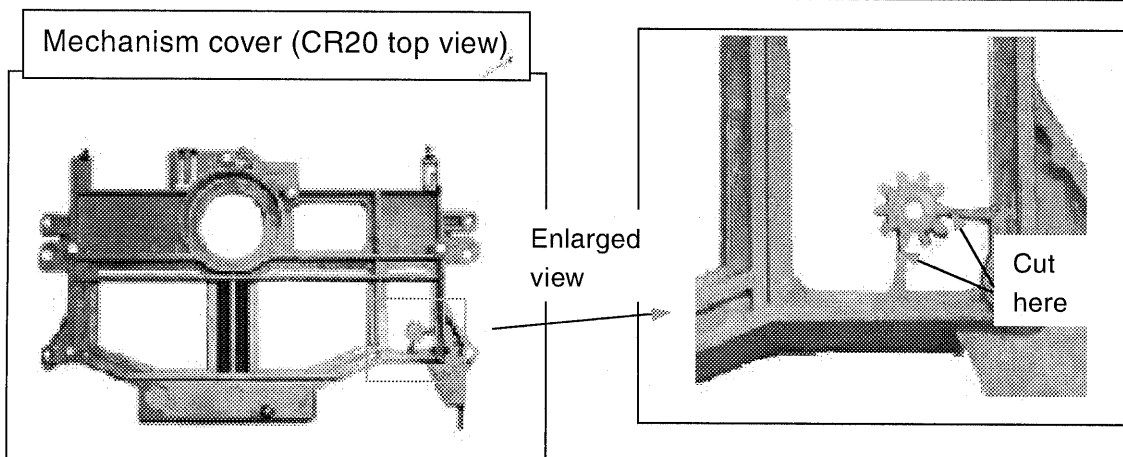
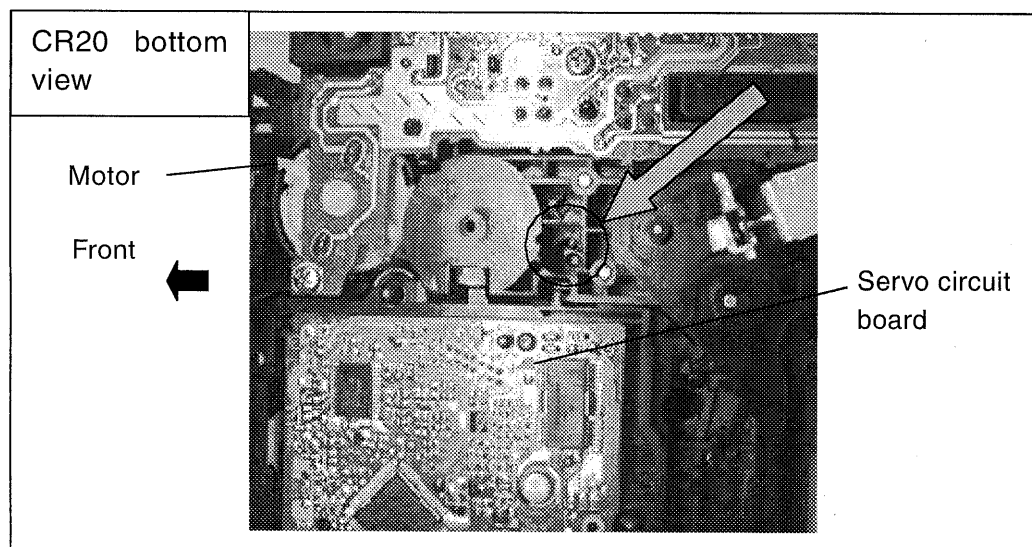
This tool is convenient for use when performing repairs on the mechanism.

It can be used to turn the drive gear in order to open and close the tray and to move the tray to the disc stocking position, and also to confirm the upward and downward movement of the traverse and the spindle base.

Instructions for use

- (1) When inserted into a hex driver or wrench (2 mm on a side), the tip of the gear tool will protrude about 1 to 2 mm.
- (2) Insert the gear tool into the hole (indicated by the arrow in the figure below) on the underside of the CR20 and turn it. (When the tool is turned in the clockwise direction as seen from the underside of the mechanism, the tray will open.)
- (3) For the SL-HS75, the gear attached to the mechanism cover during production can be removed and used.

Note: If the unit has been previously repaired, the gear may have already been removed from the mechanism cover, so whenever removing the gear it is wise to keep it for possible future use.



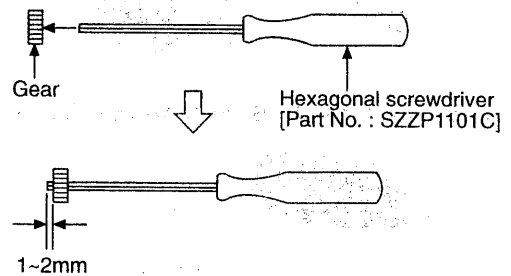
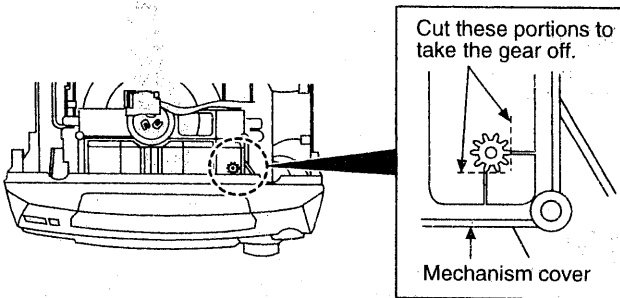
■ Operation Checks and Component Replacement Procedures

Gear for servicing (as jig) information

1. This unit has a gear which used for checking items (Open/close of disc tray, up/down operation of traverse unit by manually) when servicing. (For gear information, that is described on the items for disassembly procedures.)
2. For preparation of gear (for servicing), perform the procedures as follows.
3. In case of re-servicing the same set, the "gear for servicing" may be took off because it had been used. So, the "gear for servicing" must be stored.

1. Remove the gear provided with mechanism cover as shown below.

2. Insert the hexagonal screwdriver (2mm) into the gear, and then project the tip of screwdriver for 1~2mm length.



(Preparation of gear as jig is completed.)

This unit contains the self-diagnositics function displayed in improper operatins. For error code displayed, refer to the items in self-diagnostic function.

● Contents

■ Disassembly instruction for checking procedures of each P.C.B.

Page.

- | | |
|--|--|
| 1. Checking for the main P.C.B. | |
| 2. Disassembly for the CD changer unit | |
| 2-1 Disassembly for the disc tray ornament | |
| 2-2 Disassembly for the CD changer unit | |
| 3. Checking for the unit under operational condition | |
| 3-1 Initial setting of CD unit | |
| 3-2 Checking for the self-diagnostics function | |
| 3-3 Checking for the CD servo P.C.B. | |
| 3-4 Checking for the FL P.C.B. and cassette mechanism control P.C.B. | |
| 3-5 Checking for the power supply P.C.B. | |

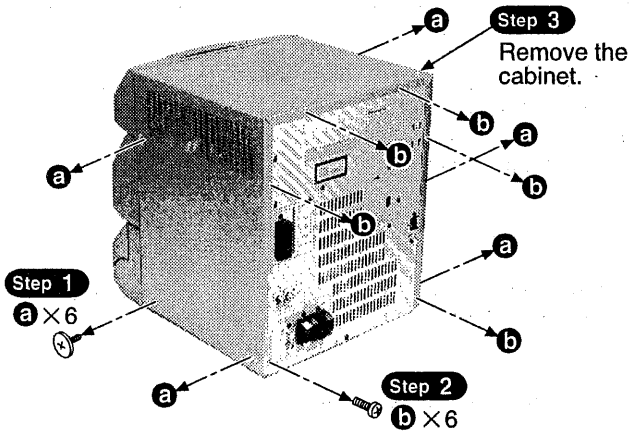
■ Main Component Replacement Procedures/Each parts disassembly and reassembly

- | | |
|--|--|
| 1. Replacement for the traverse desk ass'y (CD mechanism) | |
| 2. Replacement for the disc tray (CD mechanism) | |
| 3. Disassembly and reassembly for mechanism base drive unit (CD mechanism) | |
| 4. Replacement for the moter (CD mechanism) | |
| 5. Replacement for the pinch roller ass'y and head block (Cassette mechanism) | |
| 6. Replacement for the motor ass'y, capstan belt A, capstan belt B and winding belt (Cassette mechanism) | |
| 7. Replacement for the components parts on the mechanism P.C.B. | |
| 8. Replacement for the cassette lid ass'y | |

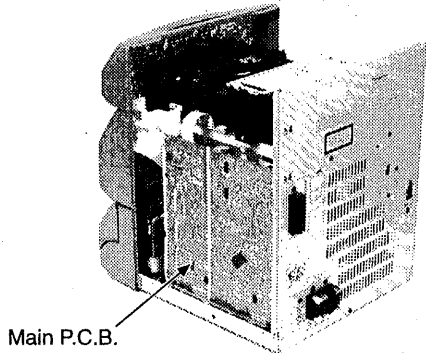
- | | |
|--------------------------------------|--|
| ■ Measure for tape trouble | |
|--------------------------------------|--|

Disassembly instruction for checking procedures of each P.C.B.

1. Checking for the main P.C.B.



• Check the main P.C.B. as shown below.



2. Disassembly for the CD changer ass'y

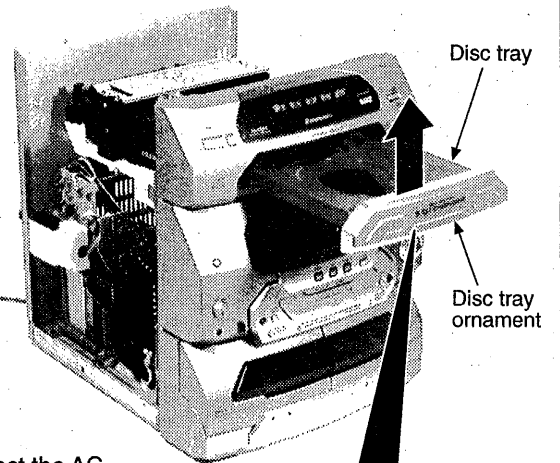
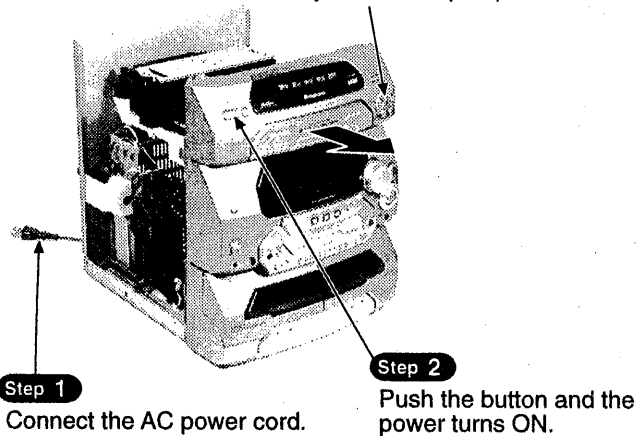
(The CD changer unit can be removed until the tray base ornament would be removed.)

2-1. Disassembly for the disc tray ornament

• Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..

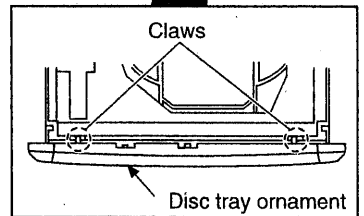
When opening the disc tray automatically

Step 3
Push the open/close button 1, so the disc tray will be open automatically. (If the other buttons would be pushed, disc tray would be open.)



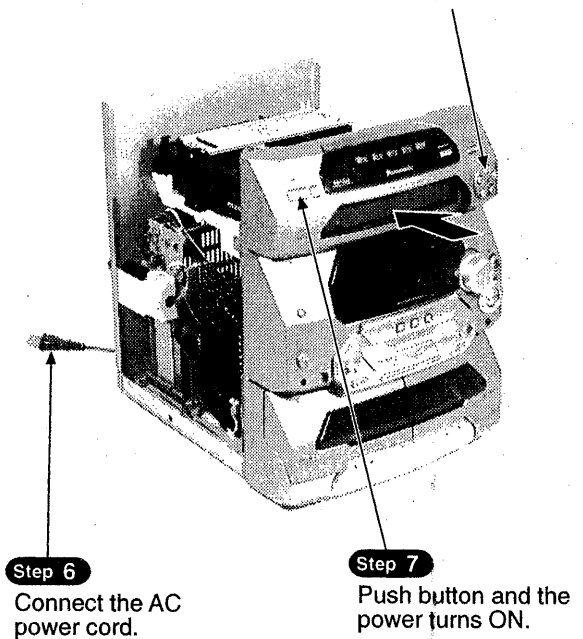
Step 4
Disconnect the AC power cord.

Step 5
Release the 2 claws, and then remove the disc tray ornament.



(Bottom side)

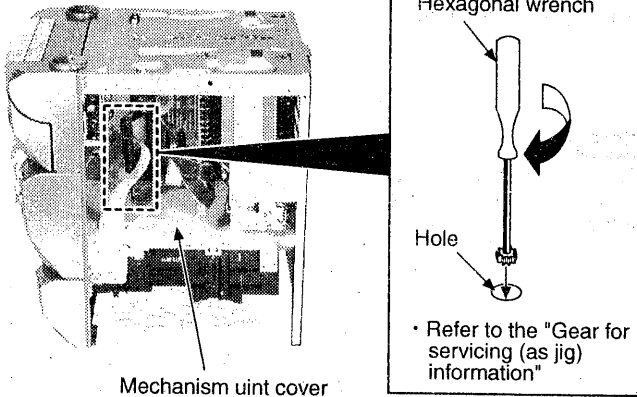
Step 8
Push the open/close button 1, so the disc tray will be closed.



When opening the disc tray manually

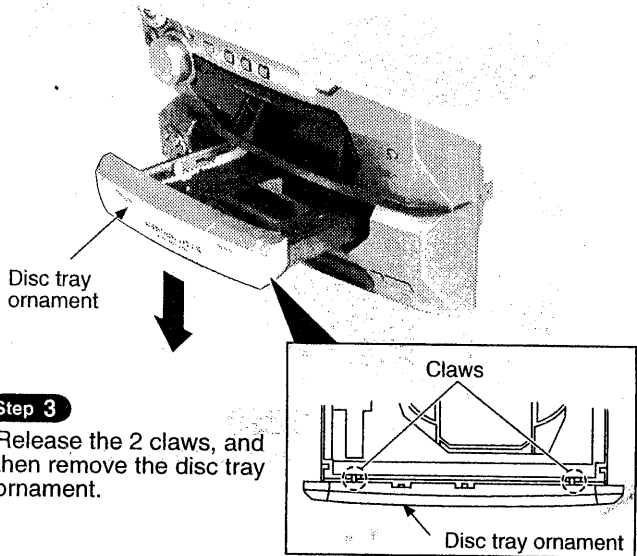
Step 1

Upset the unit.



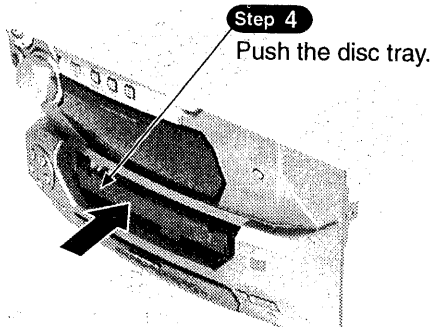
Step 2

Insert the gear for servicing into the bottom hole of mechanism unit cover, and then rotate the hexagonal wrench in the direction of arrow. So, the disc tray will be open.



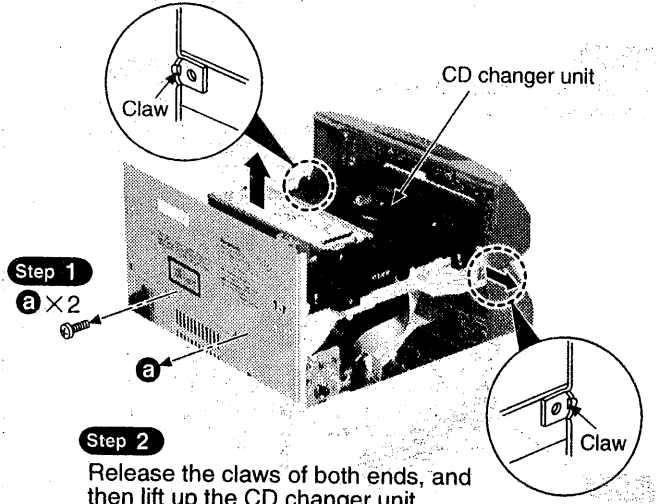
Step 3

Release the 2 claws, and then remove the disc tray ornament.



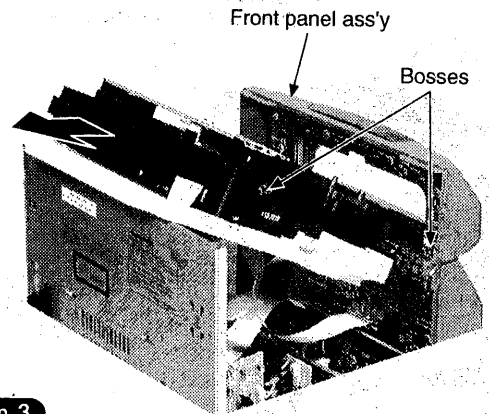
2-2. Disassembly for the CD changer unit

- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..
- Follow the disassembly instruction for the disc tray ornament of the item 2 (2-1).



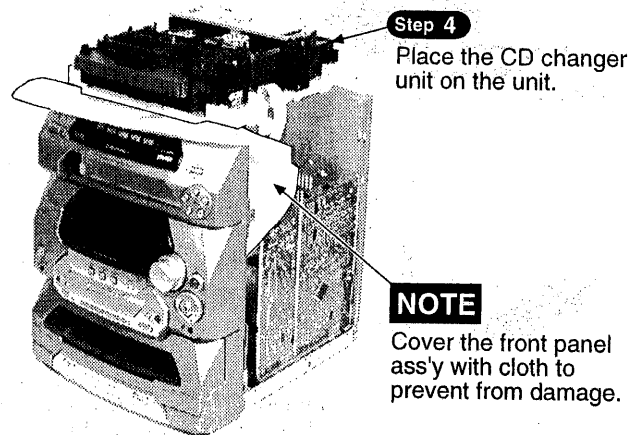
Step 3

Remove the CD changer unit from the 2 bosses of front panel ass'y.



Step 4

Place the CD changer unit on the unit.



< The preparation of checking procedures in operational condition is completed. >

3. Checking for the unit in operational condition

(Place the unit horizontally when loading the CD changer unit.)

3-1. Initial setting of CD unit

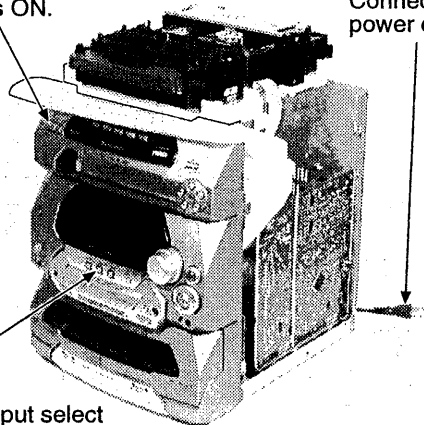
- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..

Step 2

Push power button and the power turns ON.

Step 1

Connect the AC power cord.

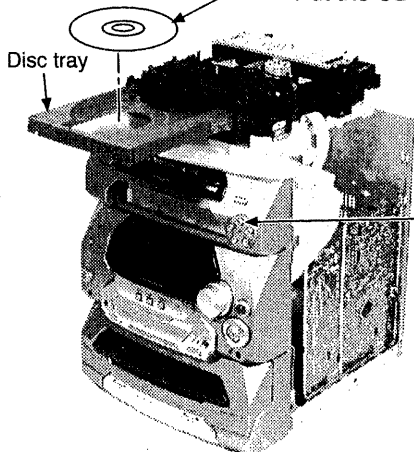


Step 3

Select the input select button to "CD".

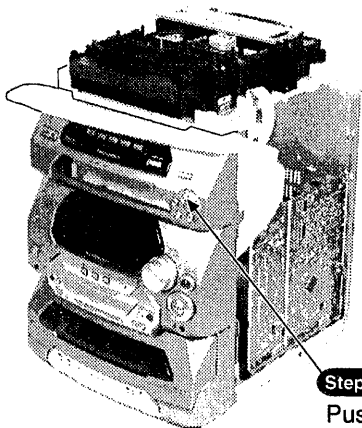
Step 5

Put the CD into the disc tray.



Step 4

Push the open/close button 1, and then open the disc tray.



Step 5

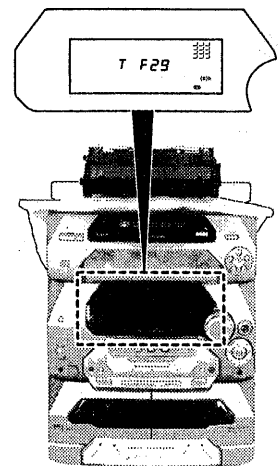
Push the open/close button 1, and then close the disc tray. (Then, the CD will load.)

〈The initial setting of CD unit is completed.〉

3-2. Checking for the self-diagnostics function

Step 1

After initial setting of CD unit, follow each operation in reference to the items of self-diagnostics function.



Step 2

Display the error code as shown right and check the items.

3-3. Checking for the CD servo P.C.B.

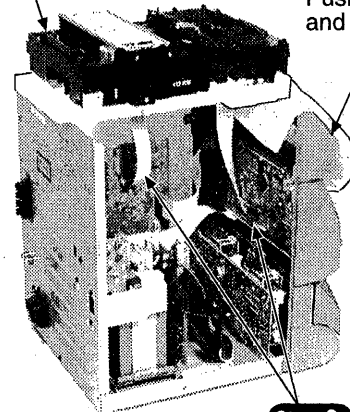
- The initial setting of CD unit must be completed.

Step 3

Remove the CD changer unit.

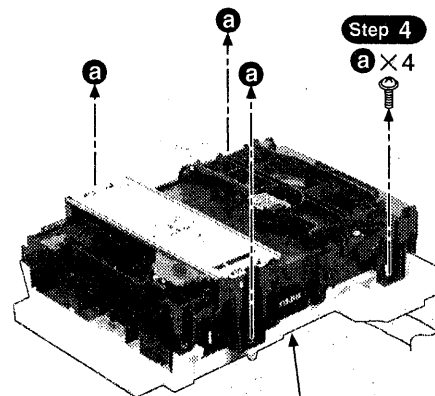
Step 1

Push the power button and the power turns OFF.



Step 2

Remove the FFC board.



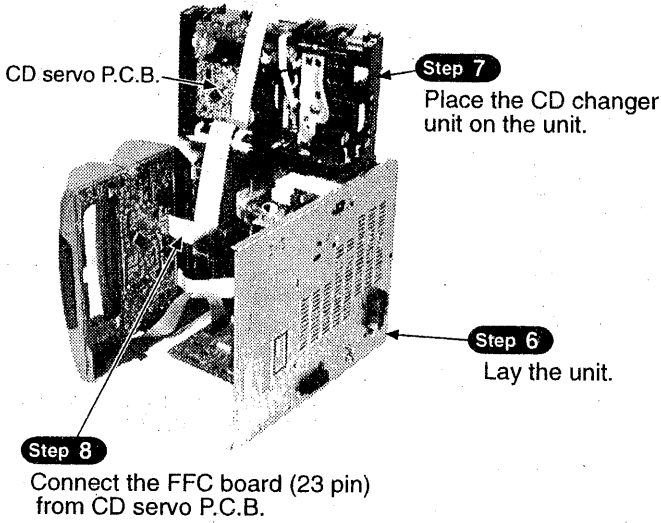
Step 4

a x 4

Step 5

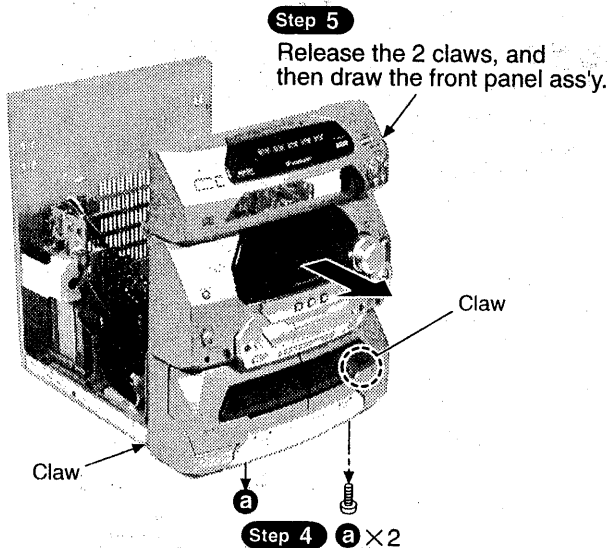
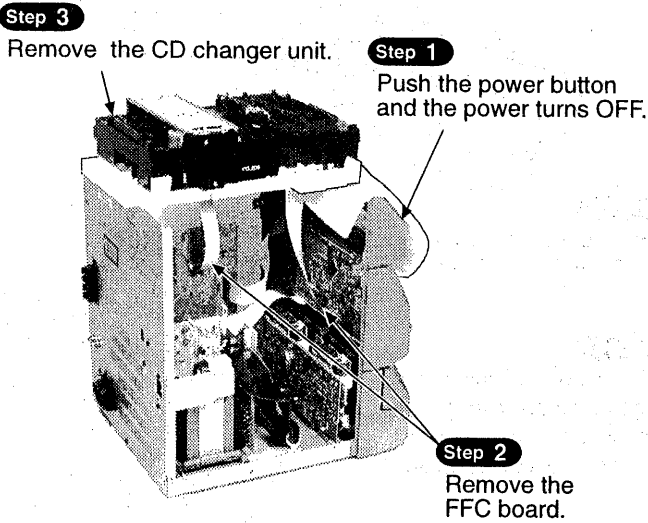
Remove the mechanism unit cover.

• Check the CD servo P.C.B. as shown below.

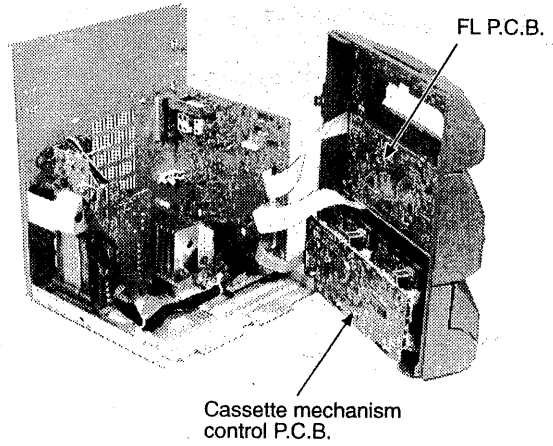


3-4. Checking for the FL P.C.B. and cassette mechanism control P.C.B.

• The initial setting of CD unit must be completed.
(Refer to the initial setting of CD unit in item 3-1.)

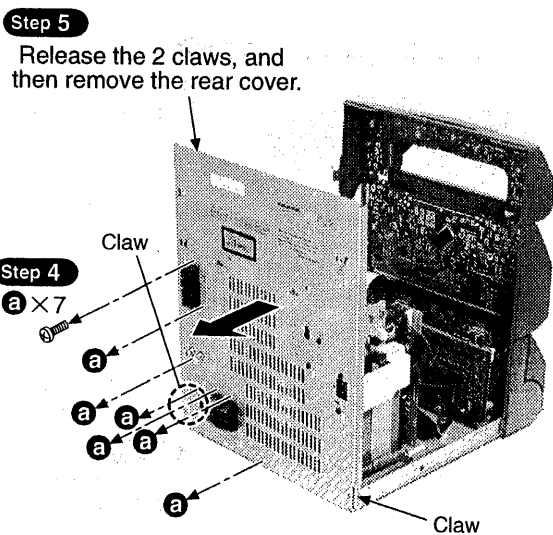
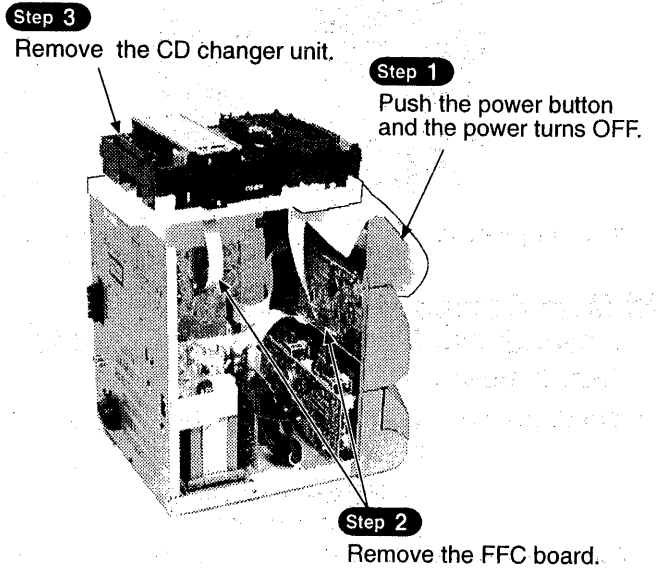


• Check the FL P.C.B. and cassette mechanism control P.C.B. as shown below.



3-5. Checking for the power supply P.C.B.

• The initial setting of CD unit must be completed.
(Refer to the initial setting of CD unit in item 3-1.)



Step 8

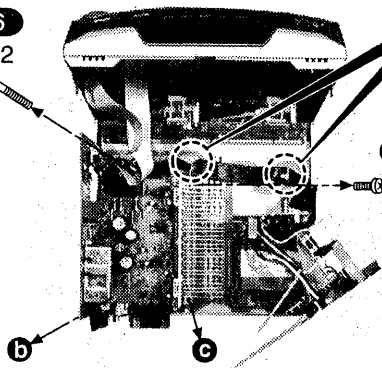
Release the cord clamber, and then remove the flat cables.

Cord clamber

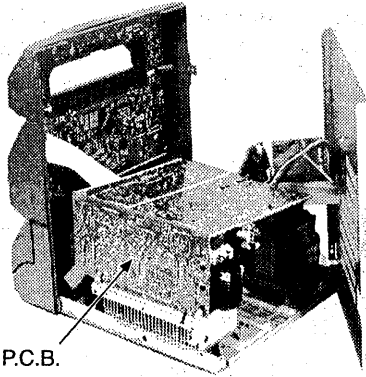
Flat cable

Step 6
b × 2

Step 7
c × 2



• Check the power supply P.C.B. as shown below.



Power supply P.C.B.

Main Component Replacement Procedures/Each parts disassembly and reassembly

1. Replacement for the traverse deck ass'y (CD mechanism)

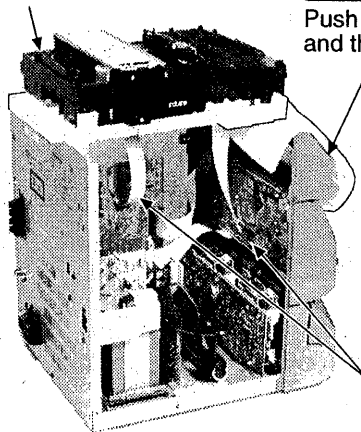
- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..
- Follow the disassembly instruction for the CD changer unit of the item 2 (2-1/2-2).

Step 3

Remove the CD changer unit.

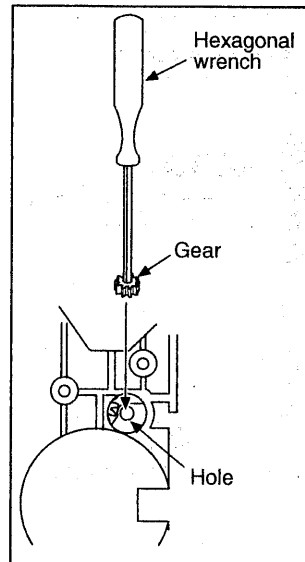
Step 1

Push the power button and the power turns OFF.



Step 2

Remove the FFC board.



Hexagonal wrench

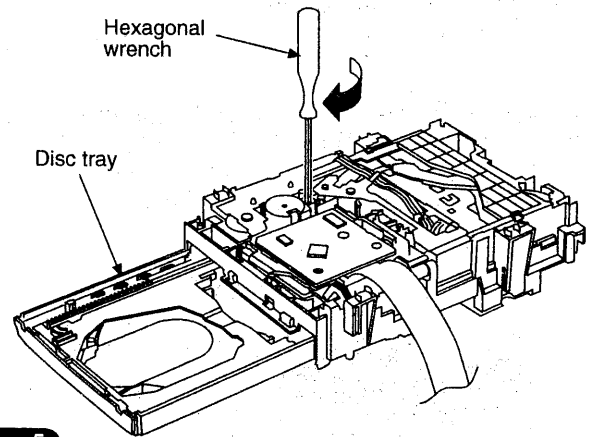
Gear

Hole

[Back side]

Step 4

Insert the gear with hexagonal wrench into the hole.



Hexagonal wrench

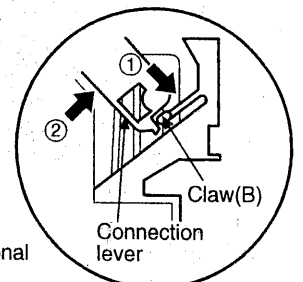
Disc tray

Step 5

Rotate the hexagonal wrench in the direction of arrow (clockwise), and then open the disc tray fully.

Step 7

Pressing the claw (B) in the direction of arrow ①, the connection lever moves in the direction of arrow ②.

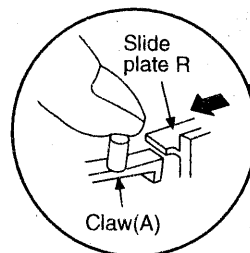


Claw(B)

Connection lever

Step 6

With pressing the claw (A), rotate the hexagonal wrench clockwise. (The slide plate R moves for a little amount.)



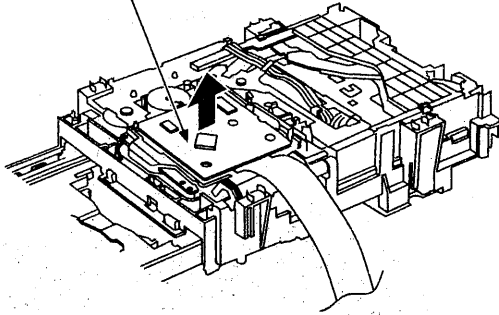
Slide plate R

Claw(A)

Hexagonal wrench

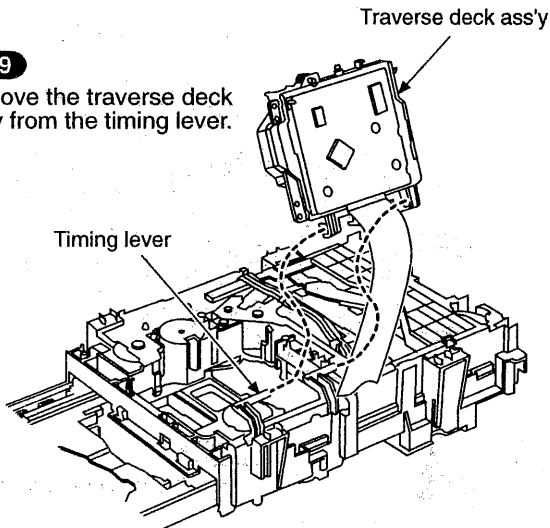
Step 8

Lift up the traverse deck ass'y.



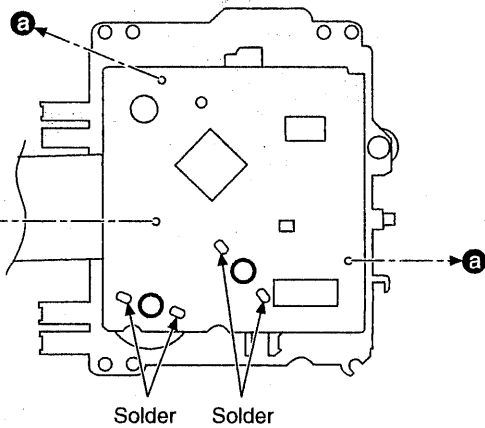
Step 9

Remove the traverse deck ass'y from the timing lever.



Step 10

a x 3
9mm

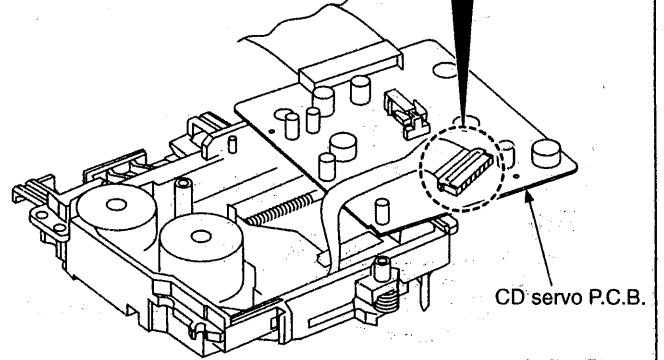
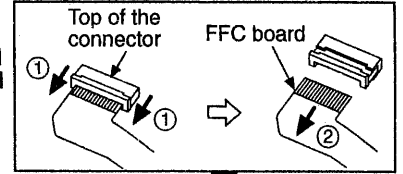


Step 11

Unsolder the motor terminals (4 points).

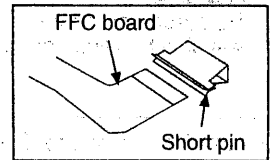
Step 12

Remove the FFC board from the connector, and then remove the CD servo P.C.B..



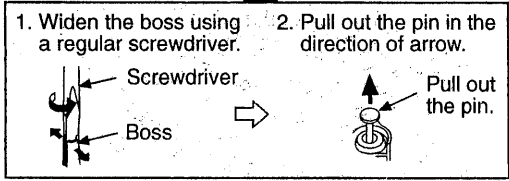
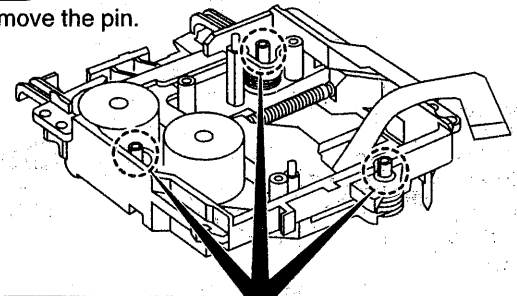
Caution:

Insert a short pin into the traverse unit FFC board. (Refer to "Handling Precautions for Traverse Deck".)



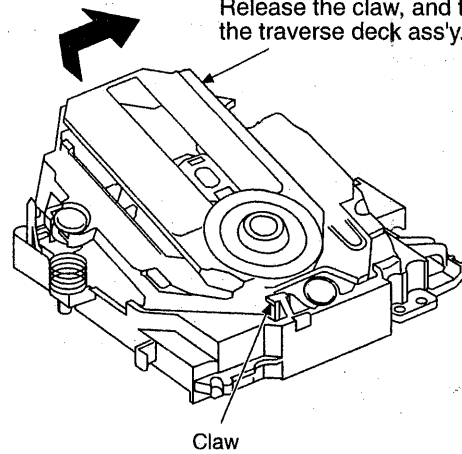
Step 13

Remove the pin.

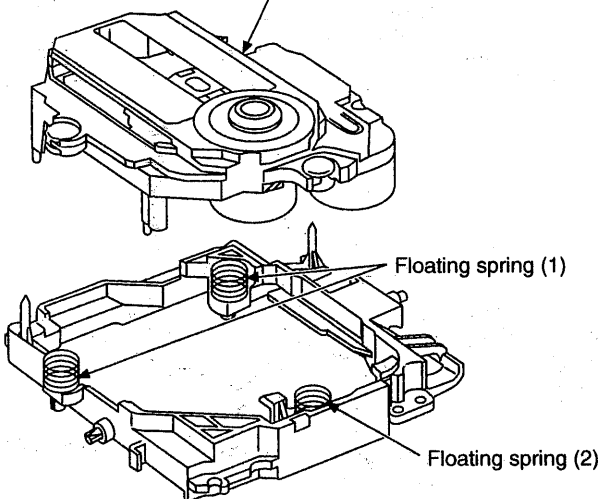


Step 14

Release the claw, and then remove the traverse deck ass'y.



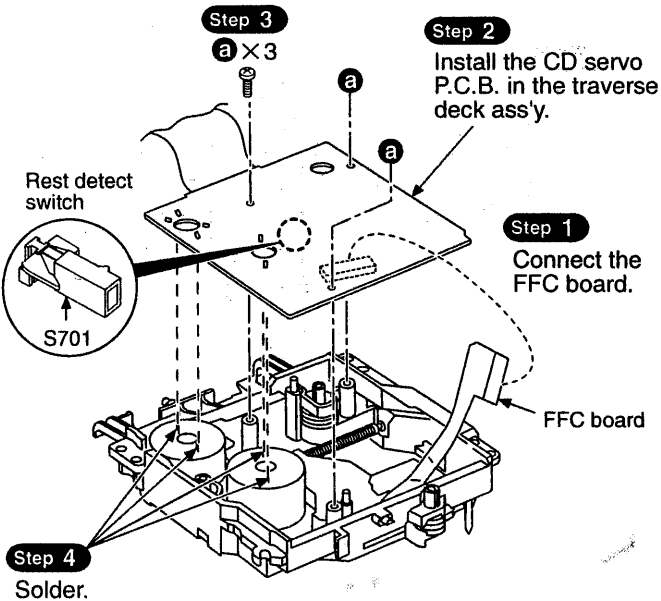
Traverse deck ass'y



NOTE

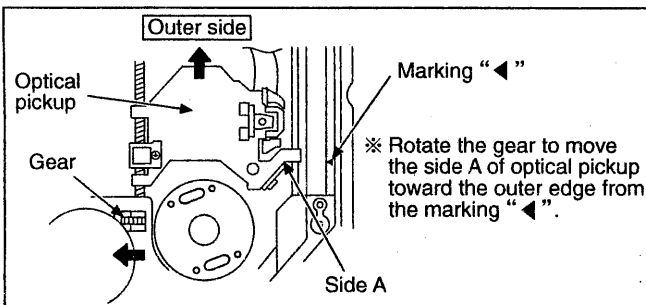
Be careful not to lose the 3 floating springs because those will also be removed on removal of the traverse deck ass'y.

Installation of the CD servo P.C.B. after replacement



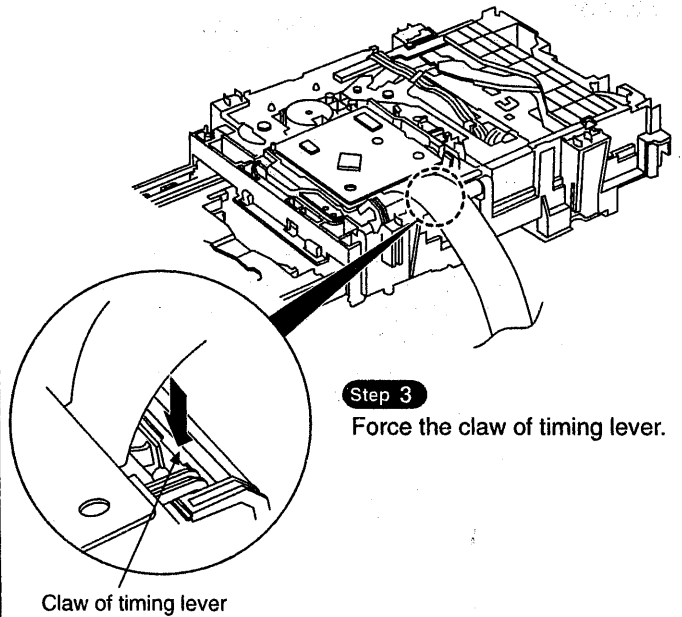
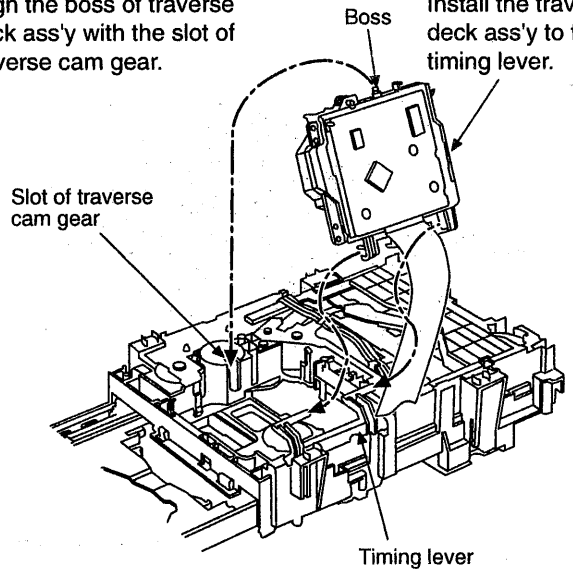
Note for installation of the CD servo P.C.B.

Before installing the CD servo P.C.B., move the optical pickup toward the outer edge from the mark "◀".
 [Otherwise, the rest detect switch (S701) mounted on the CD servo P.C.B. may be damaged.]

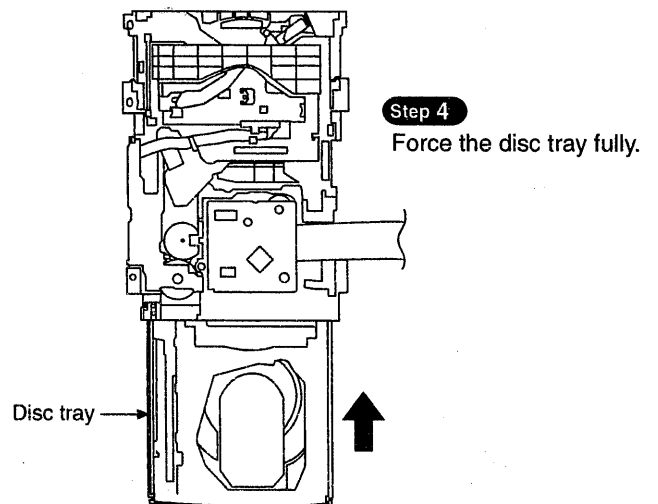


Installation for traverse deck ass'y

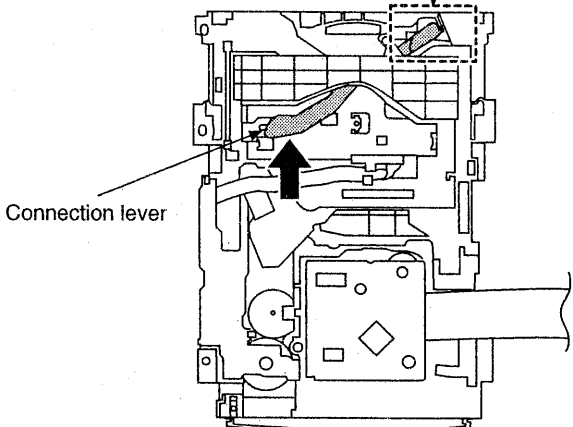
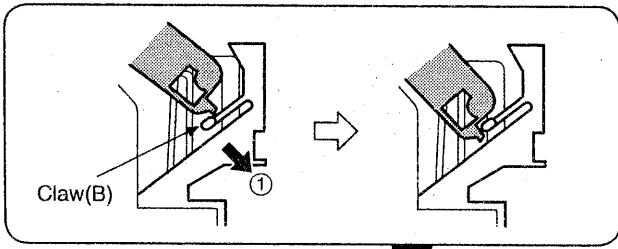
Step 2 Align the boss of traverse deck ass'y with the slot of traverse cam gear.
Step 1 Install the traverse deck ass'y to the timing lever.



Step 3 Force the claw of timing lever.



Step 4 Force the disc tray fully.



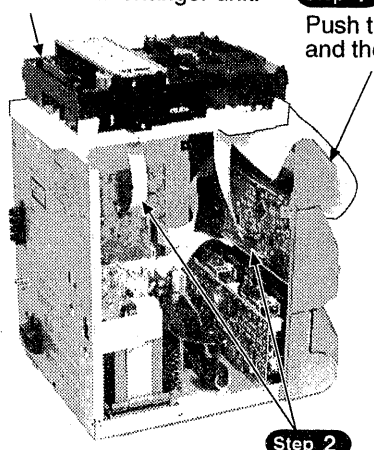
Step 5
 With pressing the claw (B) in the direction of arrow ①, force the connection lever in the direction of arrow ②.

2. Replacement for the disc tray (CD mechanism)

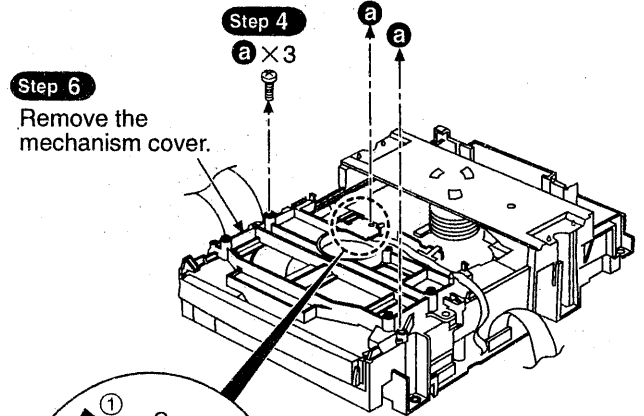
- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..
- Follow the disassembly instruction for the CD changer unit of the item 2 (2-1/2-2).

Step 3
 Remove the CD changer unit.

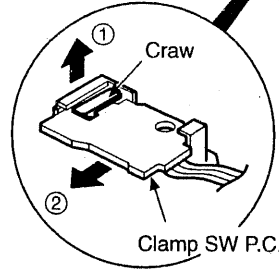
Step 1
 Push the power button and the power turns OFF.



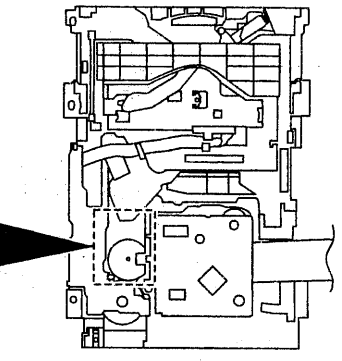
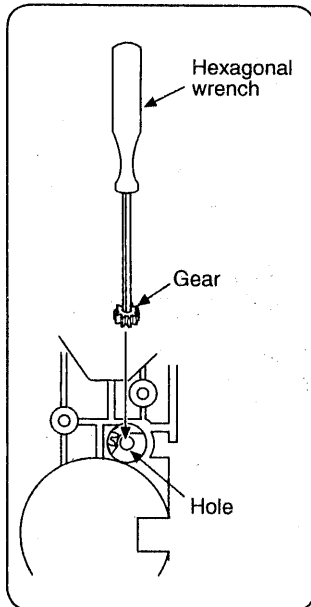
Step 2
 Remove the FFC board.



Step 6
 Remove the mechanism cover.

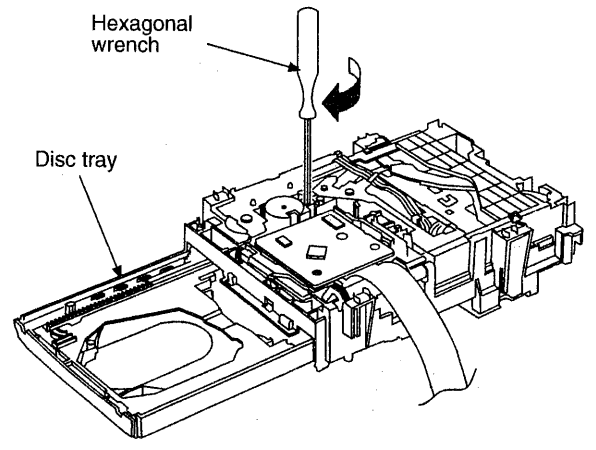


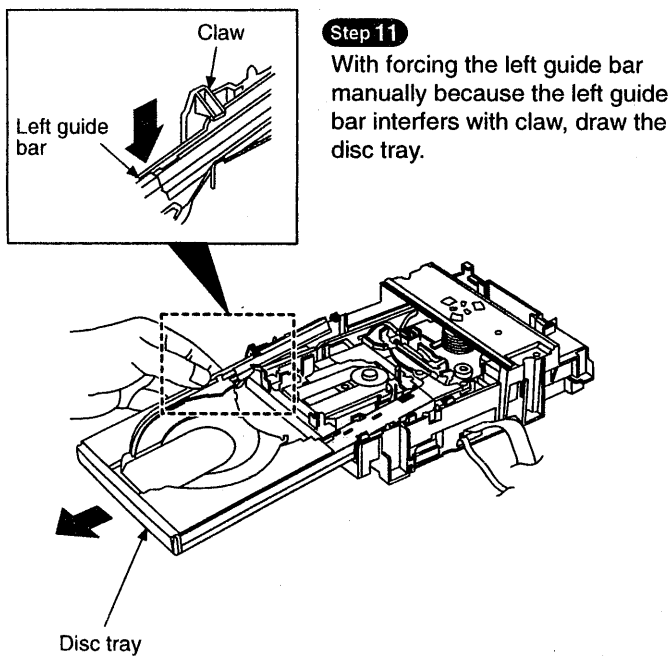
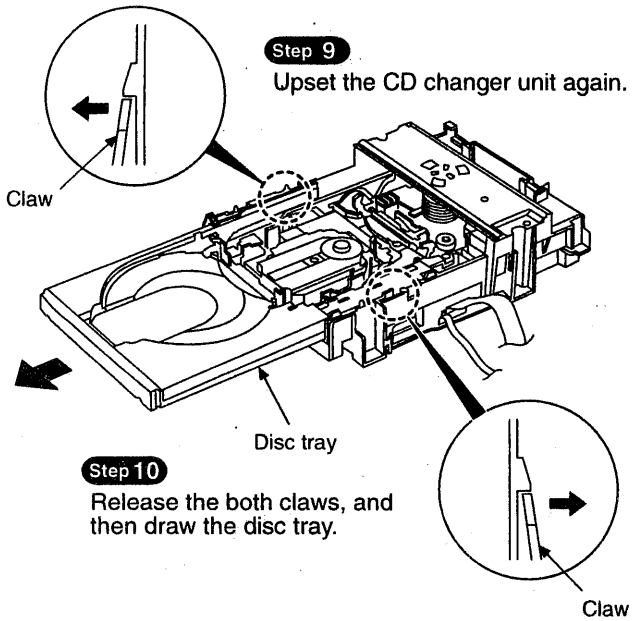
Step 5
 With lifting the claw in the direction of arrow ①, draw the clamp SW P.C.B. in the direction of arrow ②.



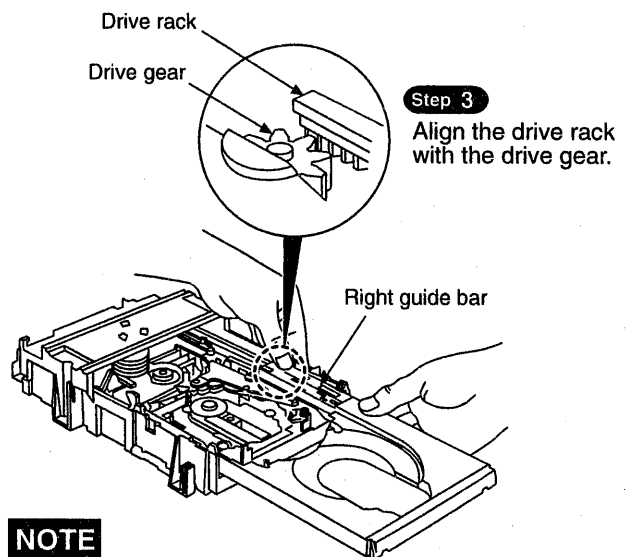
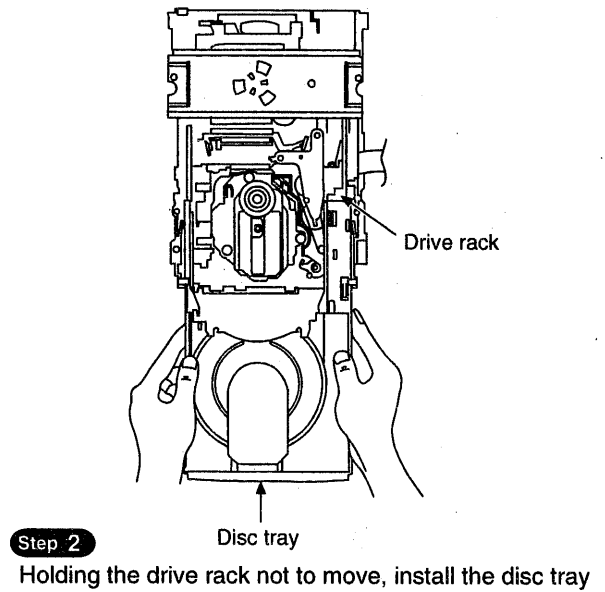
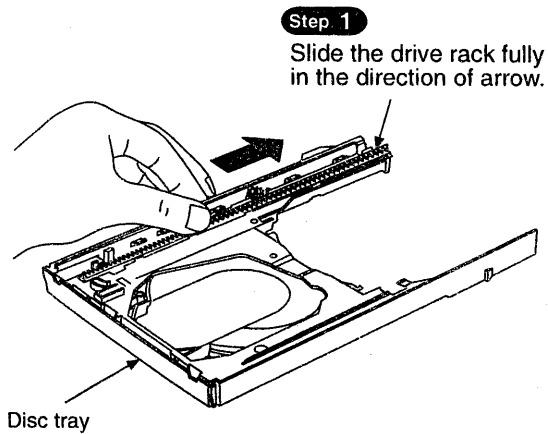
Step 7
 Insert the gear with hexagonal wrench into the hole.

Step 8
 Rotate the hexagonal wrench in the direction of arrow (clockwise), and then open the disc tray fully.

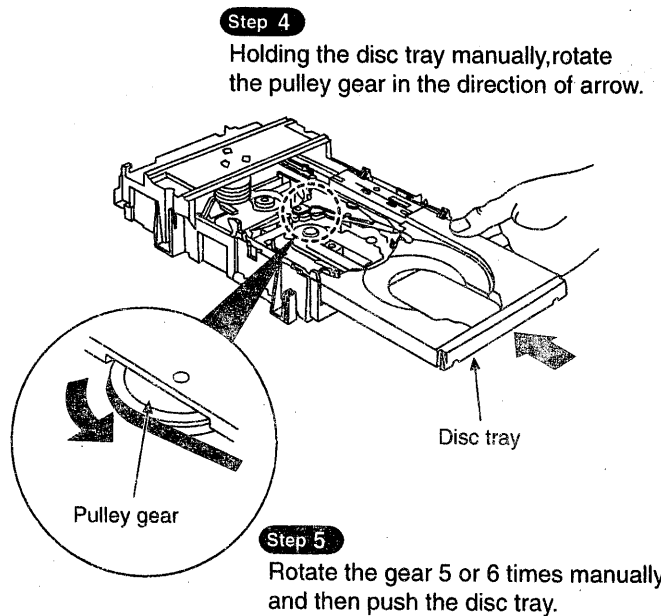




Installation of the disc tray after replacement



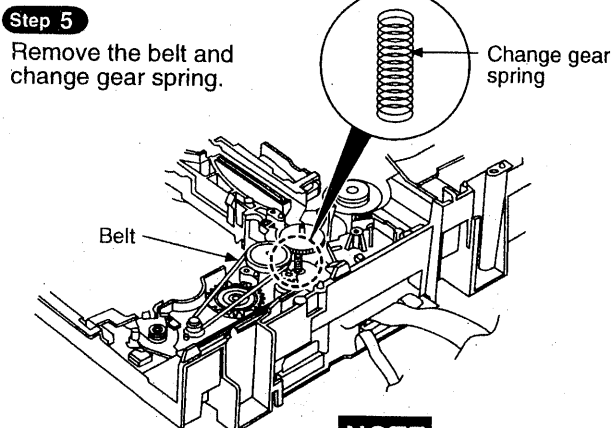
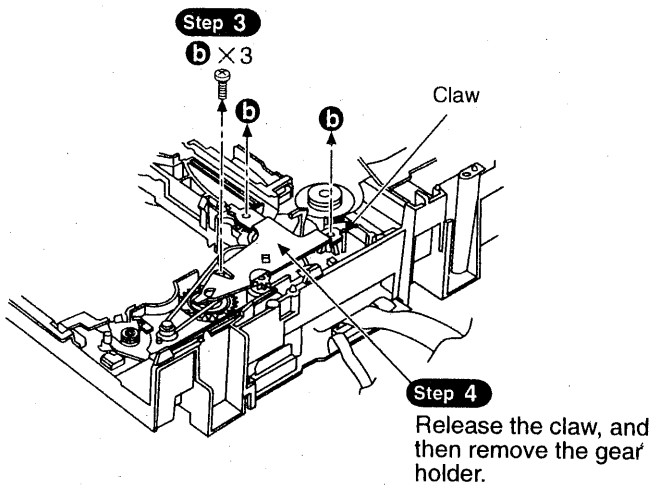
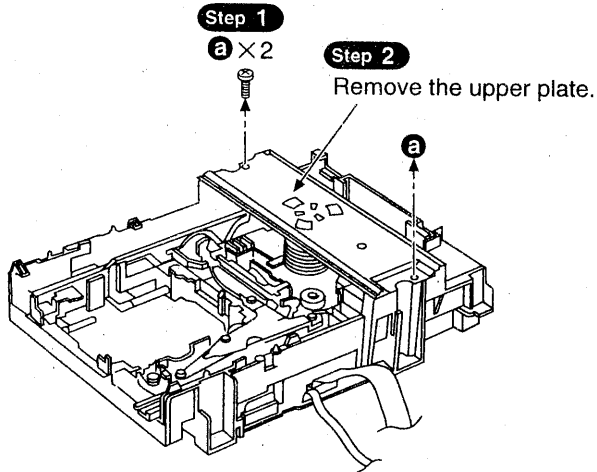
NOTE
Force the right guide bar of tray base manually not to move upwards.



3. Disassembly / reassembly for CD mechanism

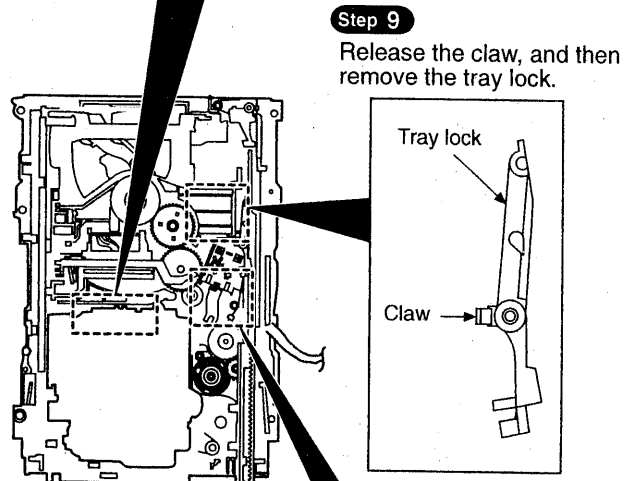
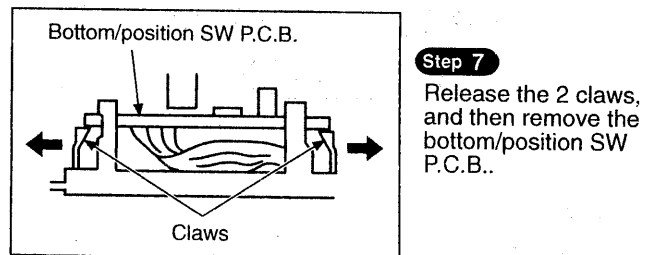
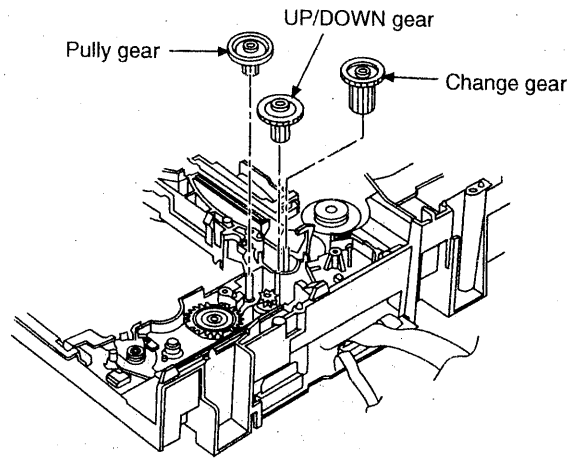
Disassembly for mechanism base drive unit

- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedure for each P.C.B..
- Follow the disassembly instruction for CD changer unit of the item 2 (2-1/2-2).
- Follow the **Step 1** ~ **Step 9** of the item 1 in main component replacement procedures.
- Follow the **Step 1** ~ **Step 10** of the item 2 in main component replacement procedures.

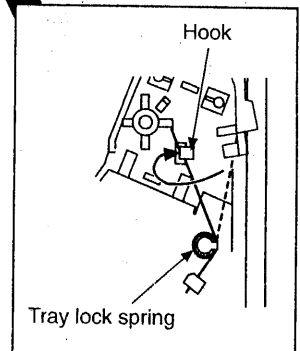


NOTE
Take care not to lose the change gear spring.

- Step 6**
Remove the pulley gear, change gear and UP/DOWN gear.



- Step 8**
Install the tray lock spring to the hook temporarily.

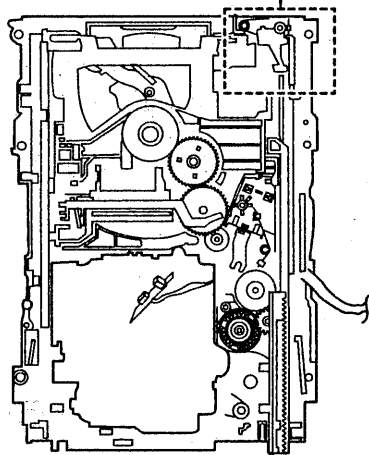
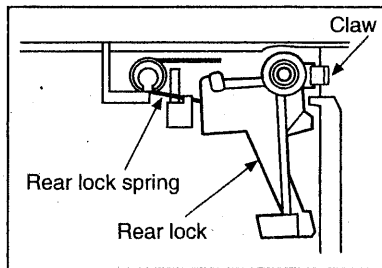


Step 10

Release the claw, and then remove the rear lock.

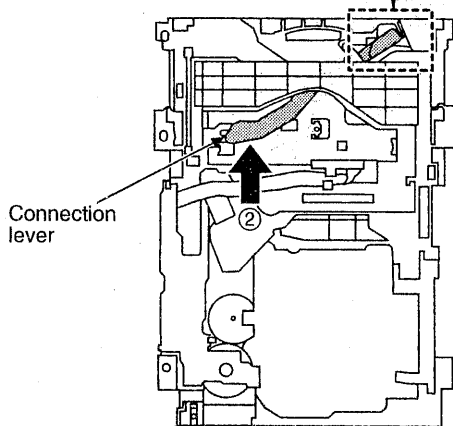
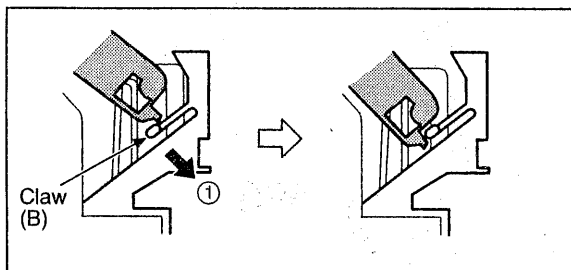
NOTE

Take care not to take the rear lock spring off.



Step 11

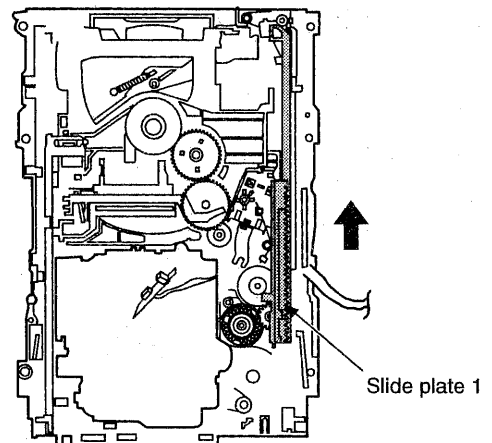
Pressing the claw (B) in the direction of arrow ①, force the connection lever in the direction of arrow ②.



Step 12

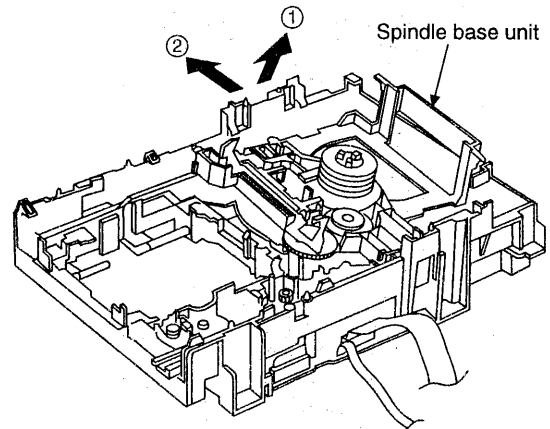
Move the slide plate 1 to the end of stock side.

(Stock side)

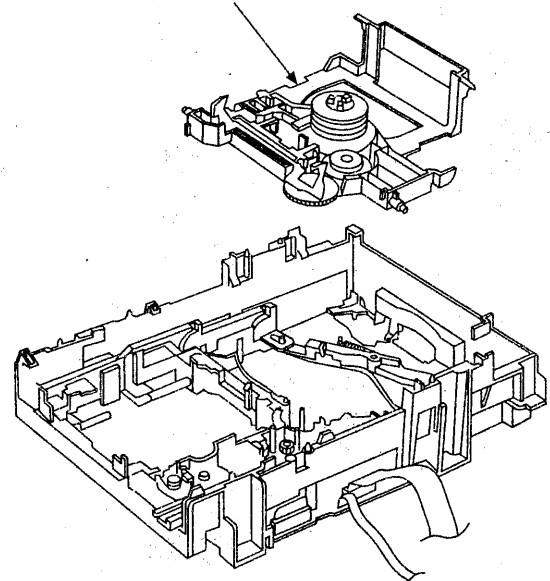


Step 13

Lift up the left end of spindle base unit in the direction of arrow ①, and then remove the unit in the direction of arrow ②.

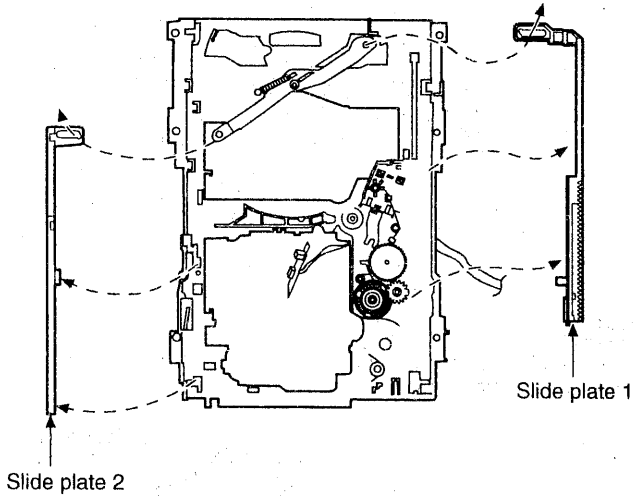


Spindle base unit



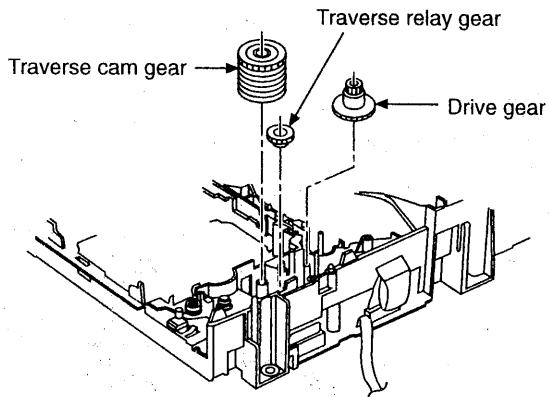
Step 14

Remove the slide plate 1 and slide plate 2.



Step 15

Remove the traverse relay gear, traverse cam gear and drive gear.

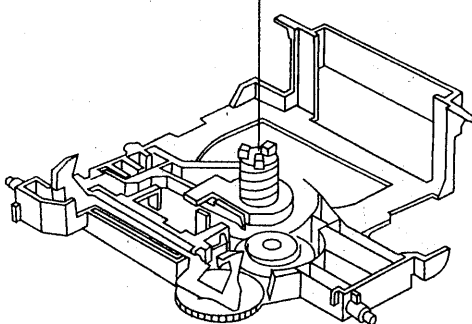


Disassembly/reassembly for the spindle base unit

Disc spacer

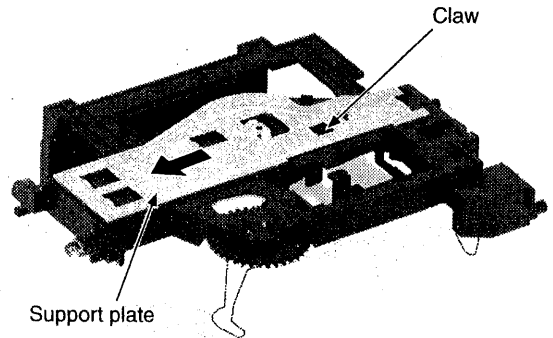
Step 1

Draw the 5 disc spacers.

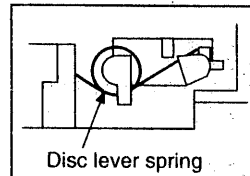


Step 2

Pushing the claw, slide the support plate in the direction of arrow, and then remove it.

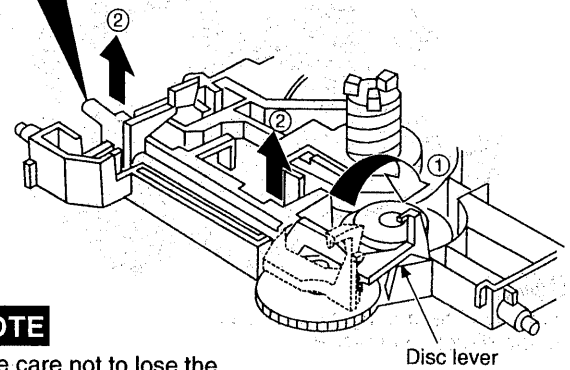


(Installation for disc lever spring)



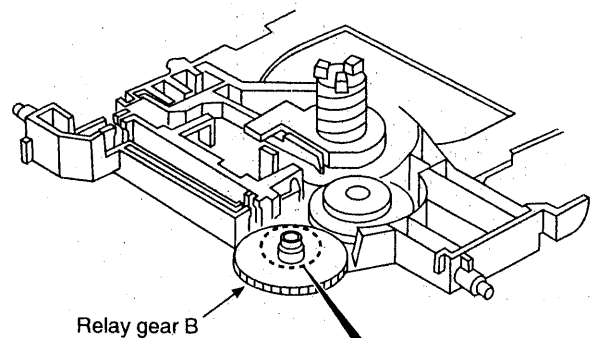
Step 3

Rotate the disc lever in the direction of arrow ①, draw the disc lever.



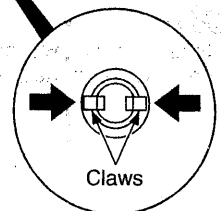
NOTE

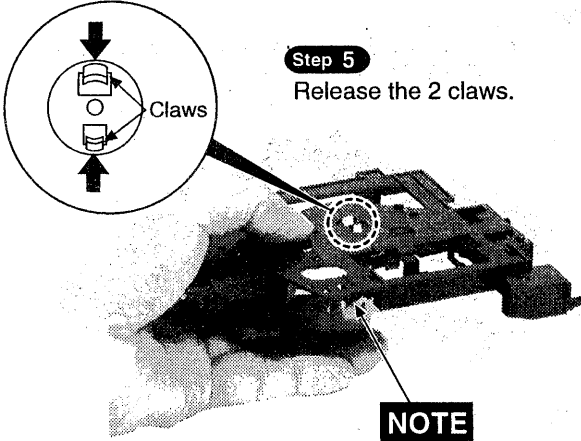
Take care not to lose the disc lever spring.



Step 4

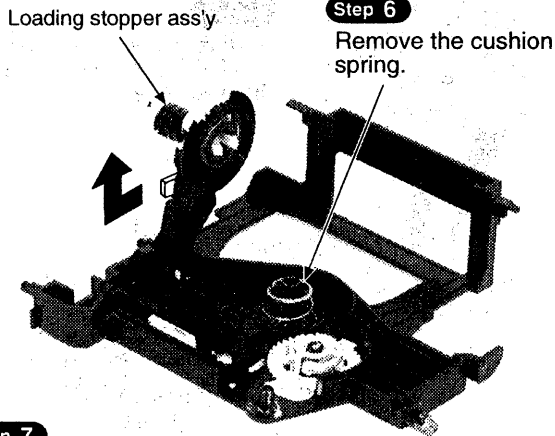
Release the 2 claws, and then draw the relay gear B.





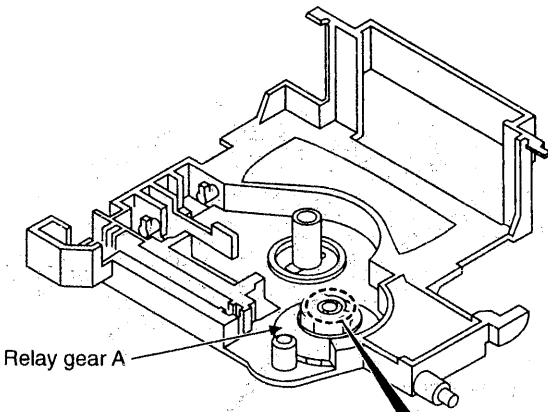
Step 5
Release the 2 claws.

NOTE
Hold the loading stopper ass'y manually because it is flipped by spring.

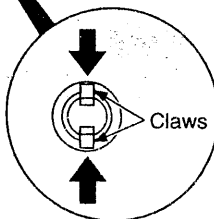


Step 6
Remove the cushion spring.

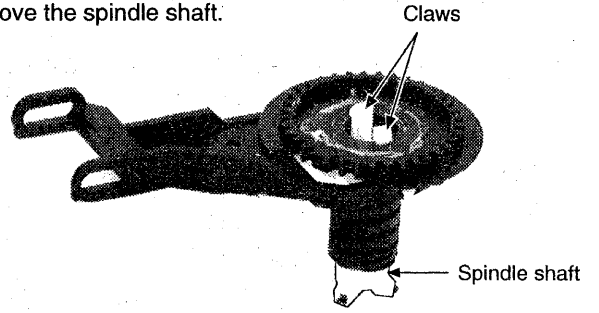
Step 7
Remove the loading stopper ass'y in the direction of arrow.



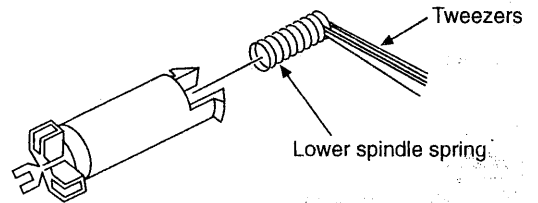
Step 8
Release the 2 claws, and then remove the relay gear A.



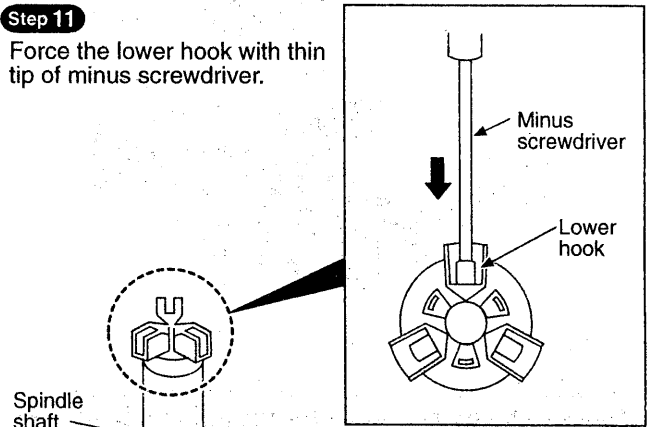
Step 9
Release the 2 claws, and then remove the spindle shaft.



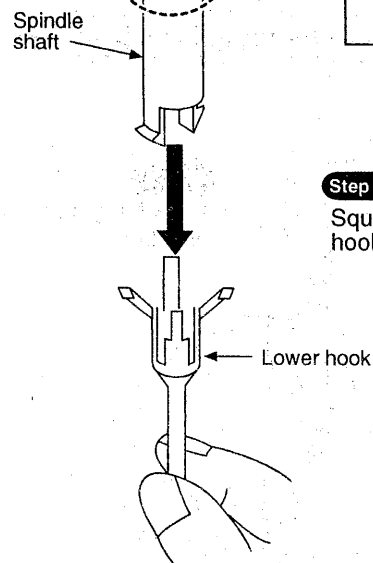
Step 10
Remove the lower spindle spring with tweezers.



Step 11
Force the lower hook with thin tip of minus screwdriver.

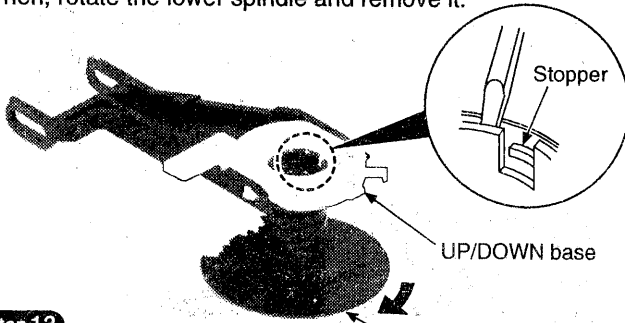


Step 12
Squeeze the shaft of lower hook, and then draw it.



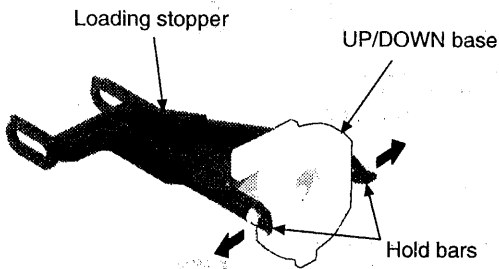
Step 14

Insert the thin tip of minus screwdriver between the lower spindle and UP/DOWN base, and then slacken the lower spindle to release the stopper. Then, rotate the lower spindle and remove it.



Step 13

Rotate the lower spindle in the direction of arrow until the lower spindle interferes with stopper.



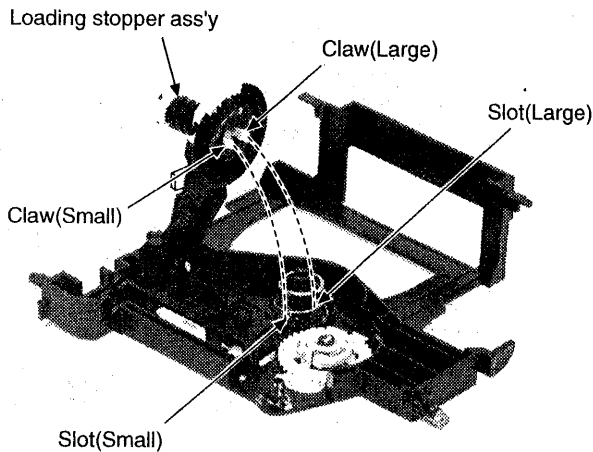
Step 15

Rotate the UP/DOWN base at a 90 degree angle. Then, spread the hold bars of loading stopper and remove the UP/DOWN base.

Installation for loading stopper ass'y

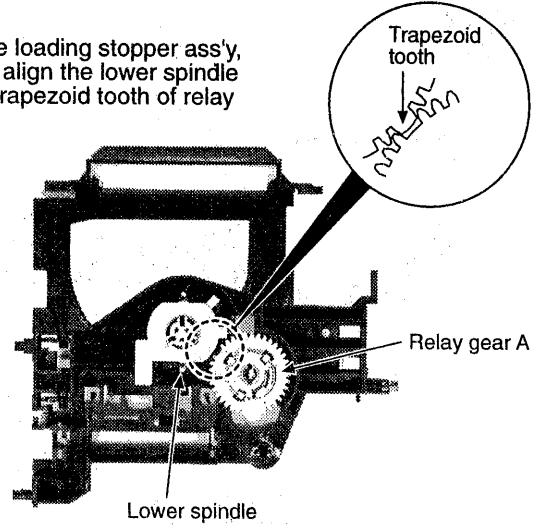
Step 1

Align the claw of loading stopper ass'y with the slot of spindle base. (Caution should be exercised when alignment of claw due to the size of claws.)



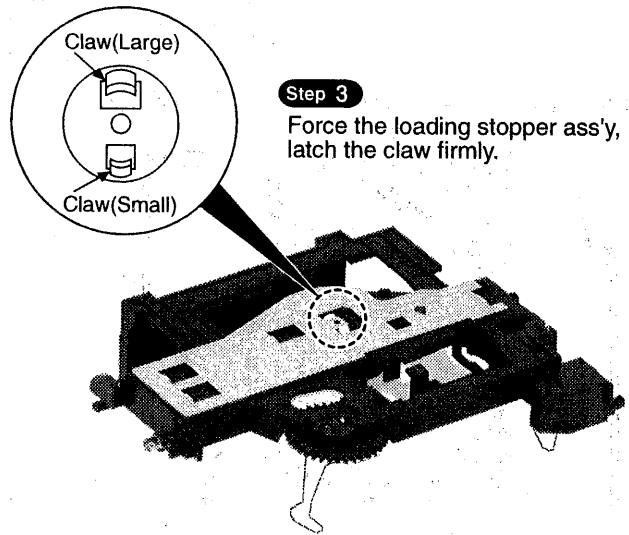
Step 2

Lower the loading stopper ass'y, and then align the lower spindle with the trapezoid tooth of relay gear A.



Step 3

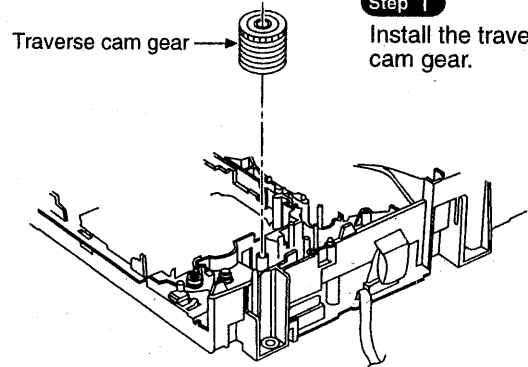
Force the loading stopper ass'y, latch the claw firmly.



Reassembling for mechanism base drive unit

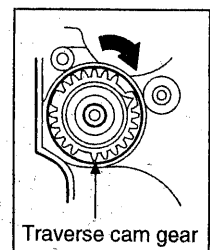
Step 1

Install the traverse cam gear.



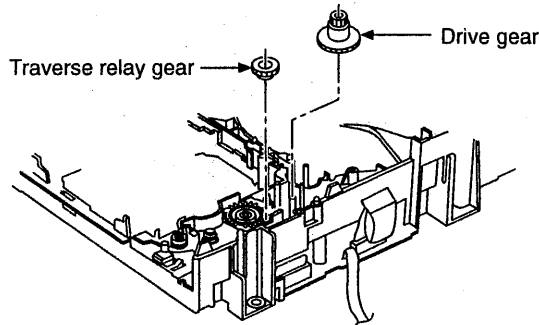
Step 2

Rotate the traverse cam gear to the direction of arrow.

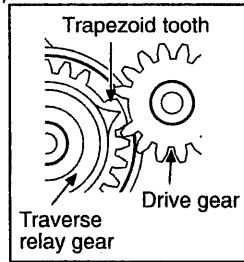


Step 3

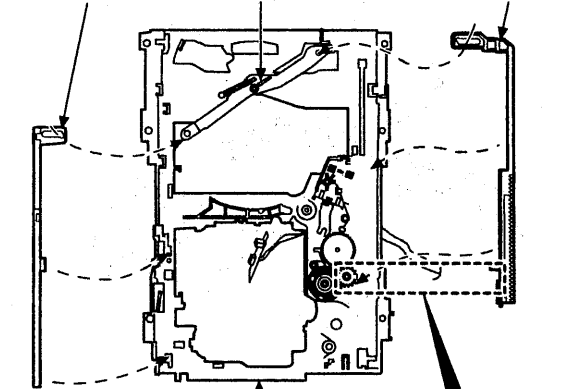
Install the drive gear and traverse relay gear.



※ When installing the traverse relay gear, align the trapezoid tooth of gear with tooth of drive gear.



Slide plate 2 Connection lever Slide plate 1

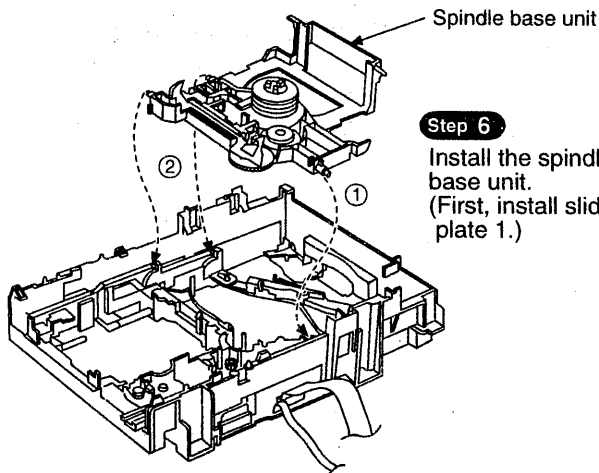
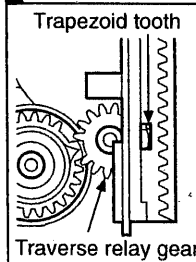


Step 4

Install the slide plate 2 to the mechanism base, and then match to the connection lever.

Step 5

Install the slide plate 1 to the mechanism base, and then match to the connection lever and align the trapezoid tooth of traverse relay gear with the slide plate 1.

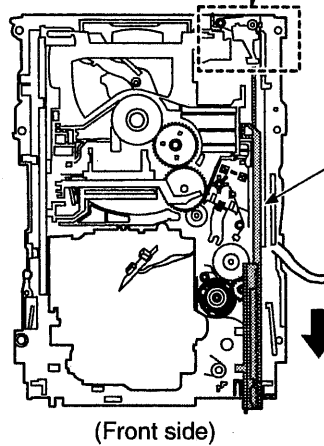
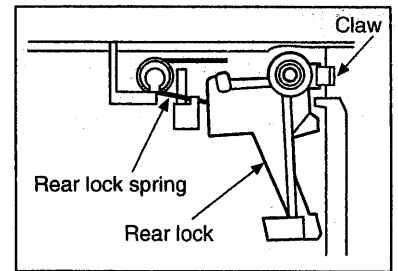


Step 6

Install the spindle base unit. (First, install slide plate 1.)

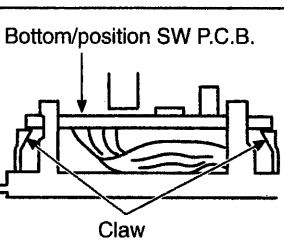
Step 8

Install the rear lock. (The claw should be latched.)



Step 7

Move the slide plate 1 to forward fully.

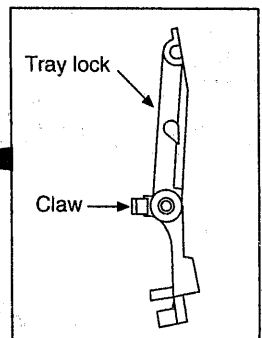
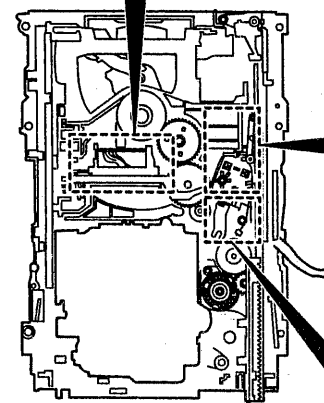


Step 9

Install the bottom/position SW P.C.B.. (The claw should be latched.)

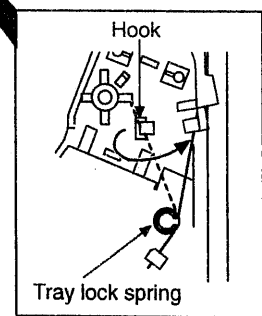
Step 10

Install the tray lock. (The claw should be latched.)



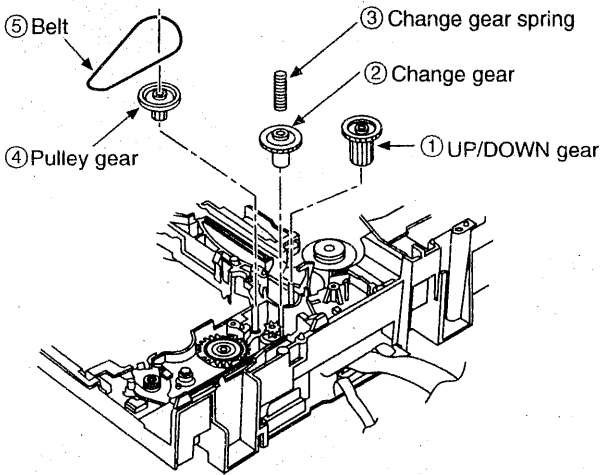
Step 11

Remove the tray lock spring from hook, and then latch to the tray lock.



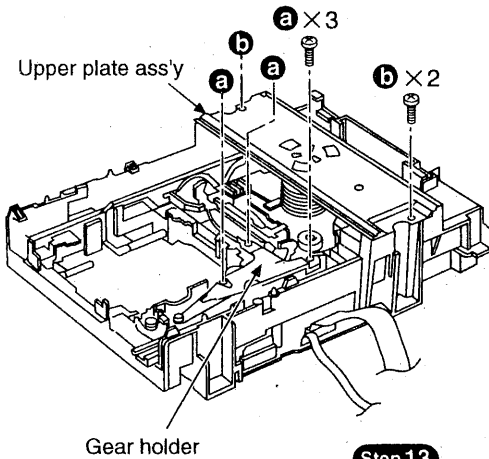
Step 12

Install the UP/DOWN gear, change gear, change gear spring, pulley gear and belt in the order of ① - ⑤.



Step 14

Install the upper plate ass'y, and then tighten the screw (b).



Step 13

Install the gear holder, and then tighten the screw (a).

Step 15

Install the tray base, traverse deck and mechanism cover. (Refer to the items 1 and 2 of Main Component Replacement Procedures.)

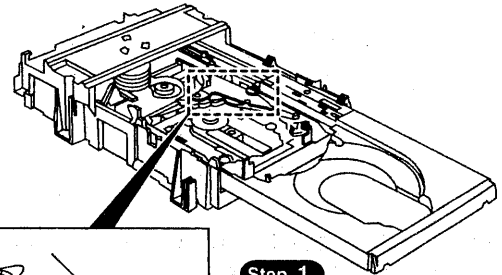
[Operation check after servicing]

Check the proper operation of following items with gear and hexagonal screwdriver.

- 1) Open/close of tray base.
- 2) Moving the tray base to the stock side.
- 3) UP/DOWN operation of spindle base unit.
- 4) UP/DOWN operation of traverse unit.

4. Replacement for the motor ass'y (CD mechanism)

- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..
- Follow the disassembly instruction for the CD changer unit of the item 2 (2-1/2-2).
- Follow the **Step 1** ~ **Step 8** of the item 2 in main component replacement procedures/each parts disassembly and reassembly.

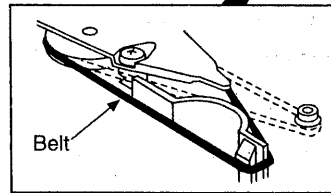


Step 1

Install the belt temporarily.

NOTE

Take care not apply the grease to the belt.



Step 2

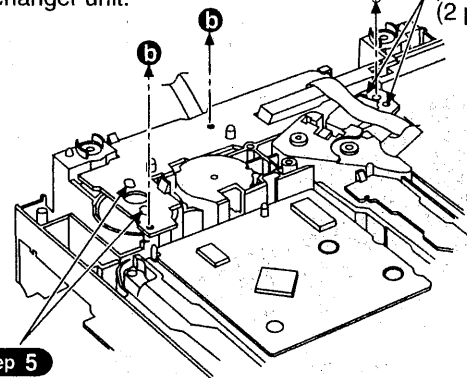
Upset the CD changer unit.

Step 3

b x 3

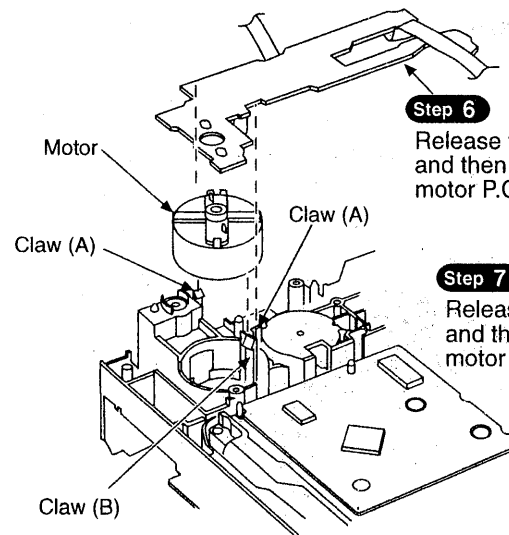
Step 4

Unsolder the plunger terminals (2 points).



Step 5

Unsolder the motor terminals (2 points).



Step 6

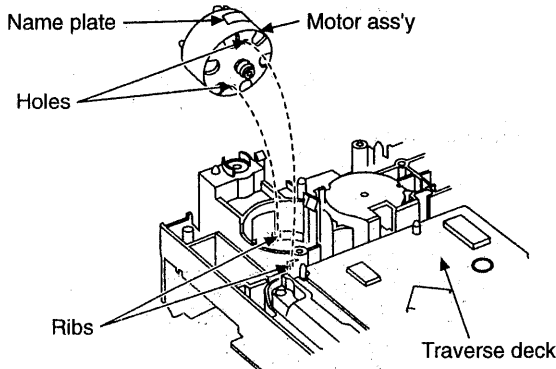
Release the 2 claws (A), and then remove the motor P.C.B..

Step 7

Release the claw (B), and then remove the motor ass'y.

Notice for motor ass'y installation

1. Locate the name plate of motor to the traverse deck.
2. Align the hole of motor with the ribs.

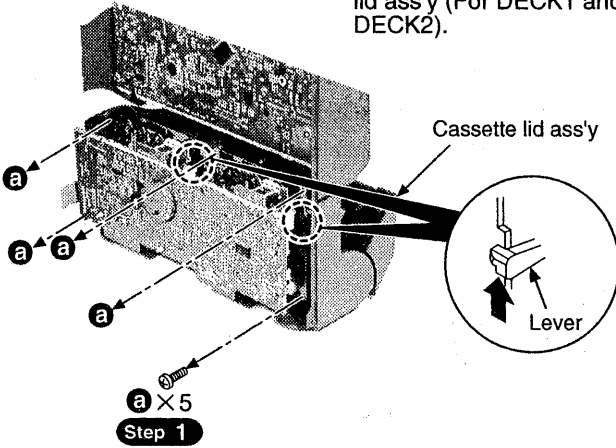


5. Replacement for the pinch roller ass'y and head block (Cassette mechanism)

- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..
- Follow the disassembly instruction for the CD changer unit of the item 2 (2-1/2-2).
- Follow the **Step 1** ~ **Step 5** of the item 3 (3-4) in disassembly instruction for checking procedures of each P.C.B..

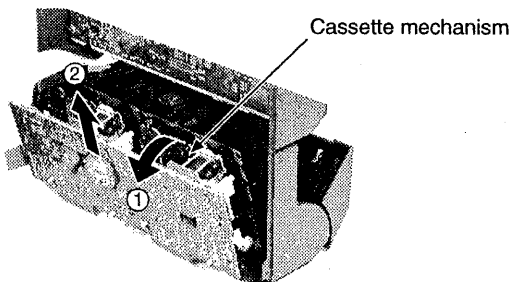
Step 2

Push the lever upward, and then open the cassette lid ass'y (For DECK1 and DECK2).



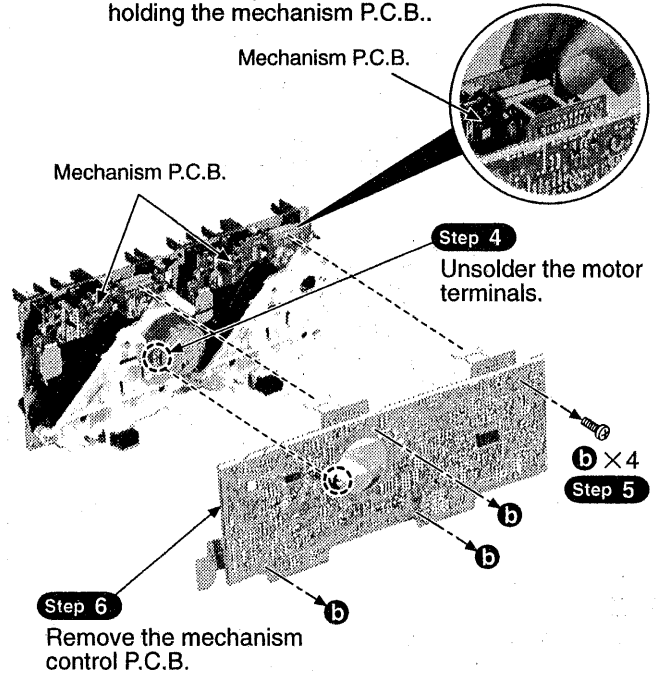
Step 3

Tilt the cassette mechanism in the direction of arrow ①, and then remove it in the direction of arrow ②.



NOTE

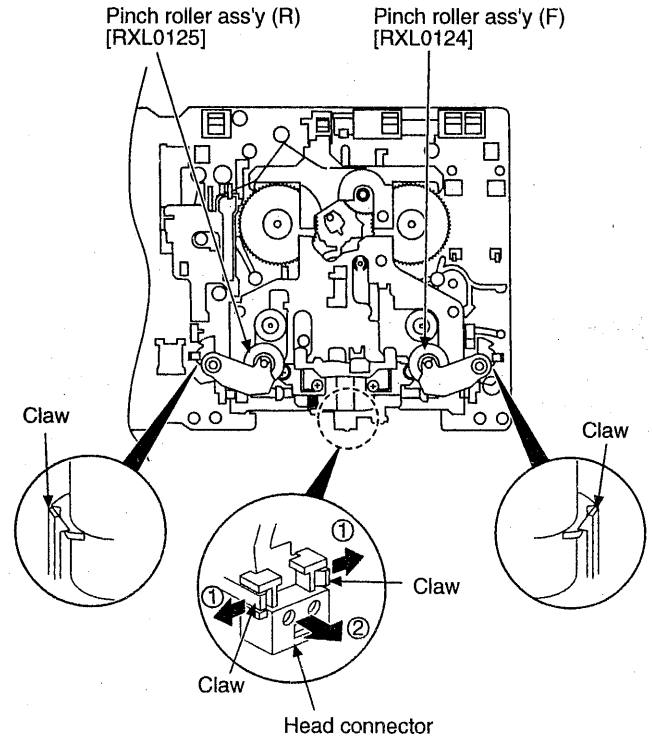
When removing the mechanism control P.C.B., remove it with holding the mechanism P.C.B..



※ The mechanism as shown below is for DECK2. For the one of DECK1, perform the same procedures.

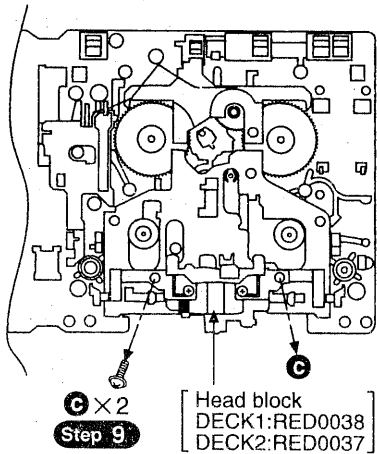
Step 7

Release the 2 claws, and then remove the pinch roller (R), (F).



Step 8

Release the 2 claws, and then remove the head connector.

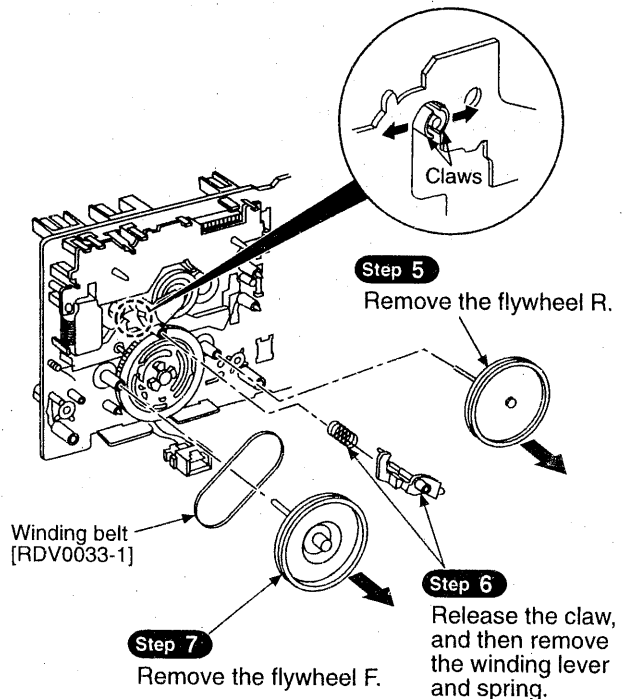
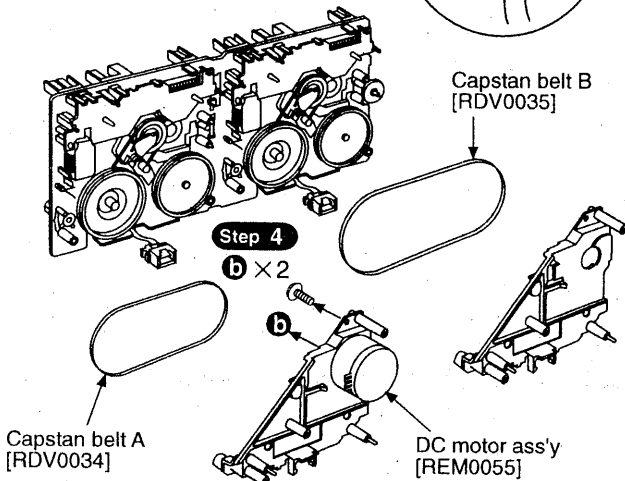
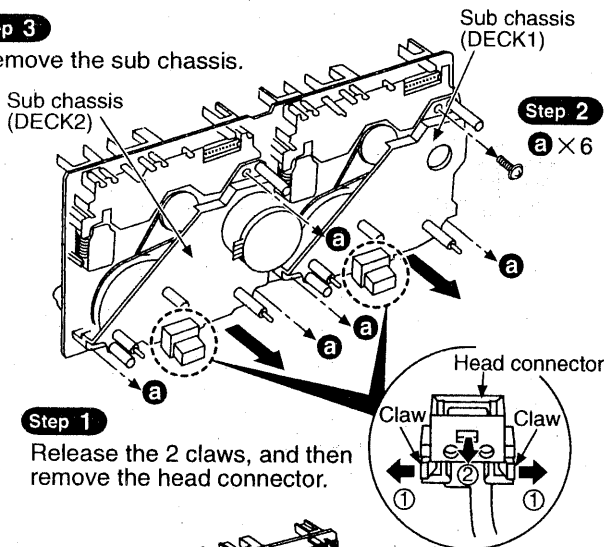


6. Replacement for the DC motor ass'y, capstan belt A, capstan belt B and winding belt (Cassette mechanism)

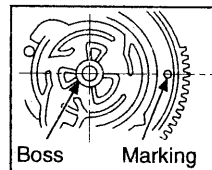
- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..
- Follow the disassembly instruction for the CD changer unit of the item 2 (2-1/2-2).
- Follow the **Step 1** ~ **Step 5** of the item 3 (3-4) in disassembly instruction for checking procedures of each P.C.B..
- Follow the **Step 1** ~ **Step 6** of the item 5 in main component replacement procedures/each parts disassembly and reassembly.

Step 3

Remove the sub chassis.

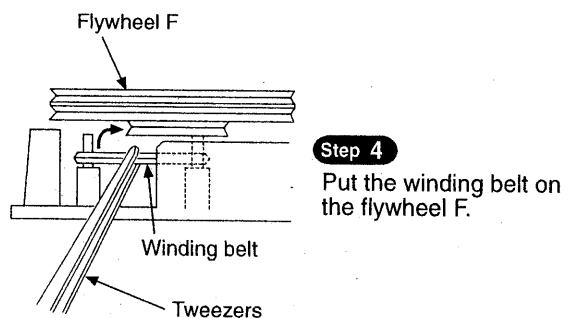
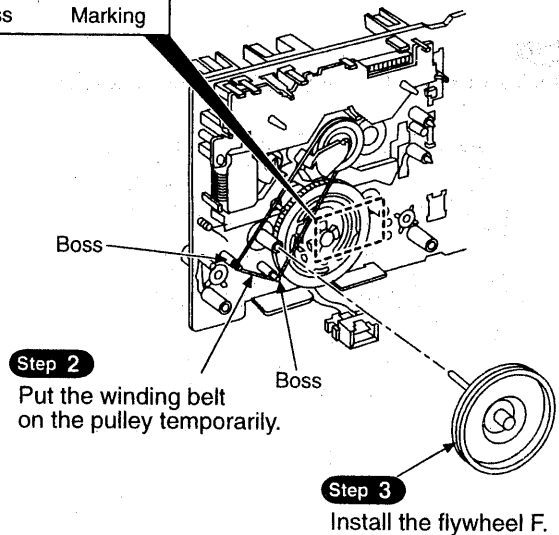


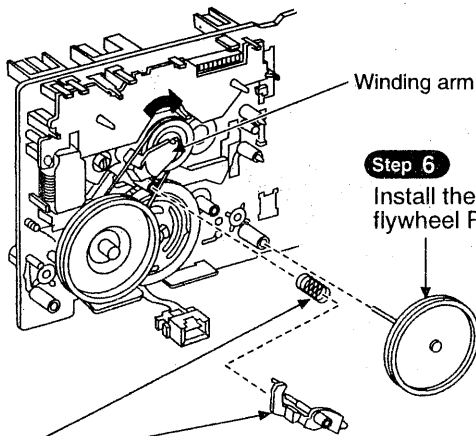
Installation of the belt



Step 1

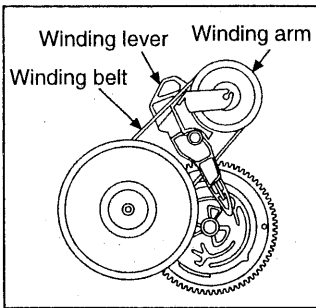
The boss and marking should be positioned horizontally.





Step 6
Install the flywheel R.

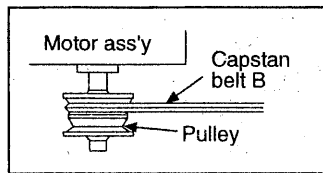
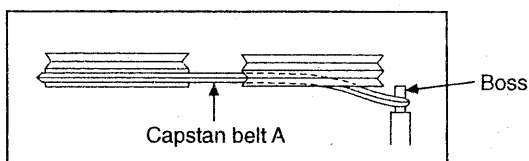
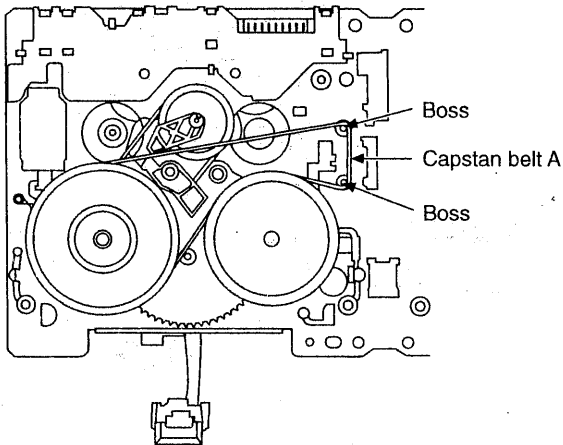
Step 5
Install the winding lever and spring while pressing the winding arm in the direction of arrow.
(The winding lever must be inserted completely and latched with claws.)



NOTE

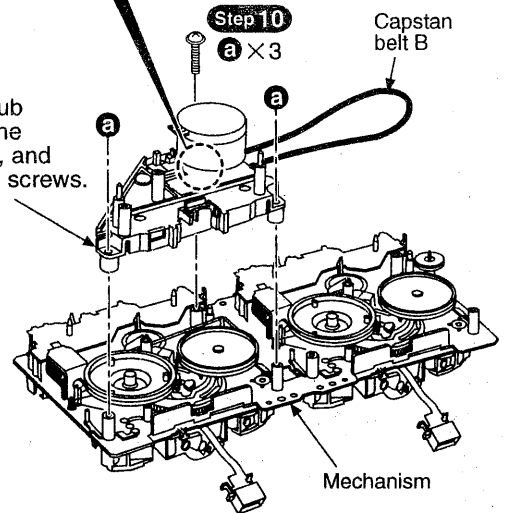
The winding lever should be positioned as shown below.

Step 7
Put the capstan belt A temporarily as shown below.



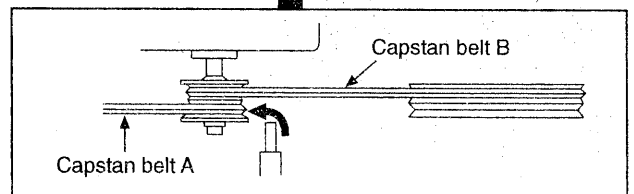
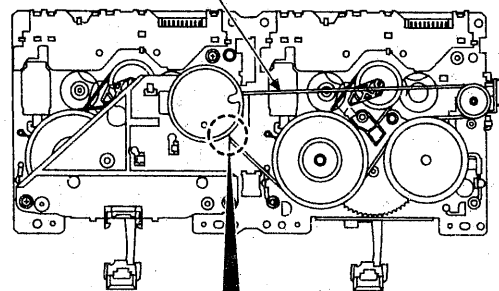
Step 8
Put the capstan belt B on the motor ass'y pulley.

Step 9
Install the sub chassis to the mechanism, and then tighten screws.



Step 10
a × 3

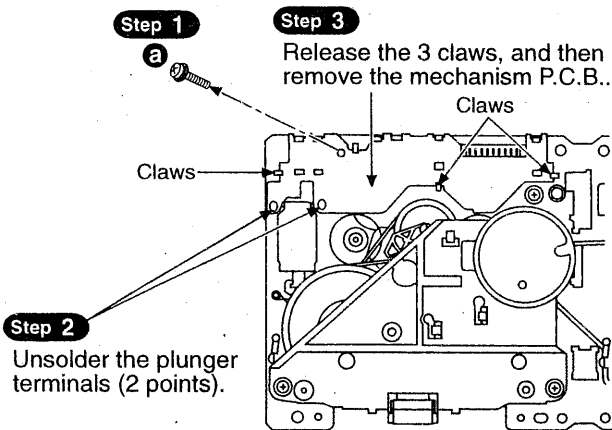
Step 11
Put the capstan belt B as shown below.



Step 12
Put the capstan belt A on the motor ass'y pulley.

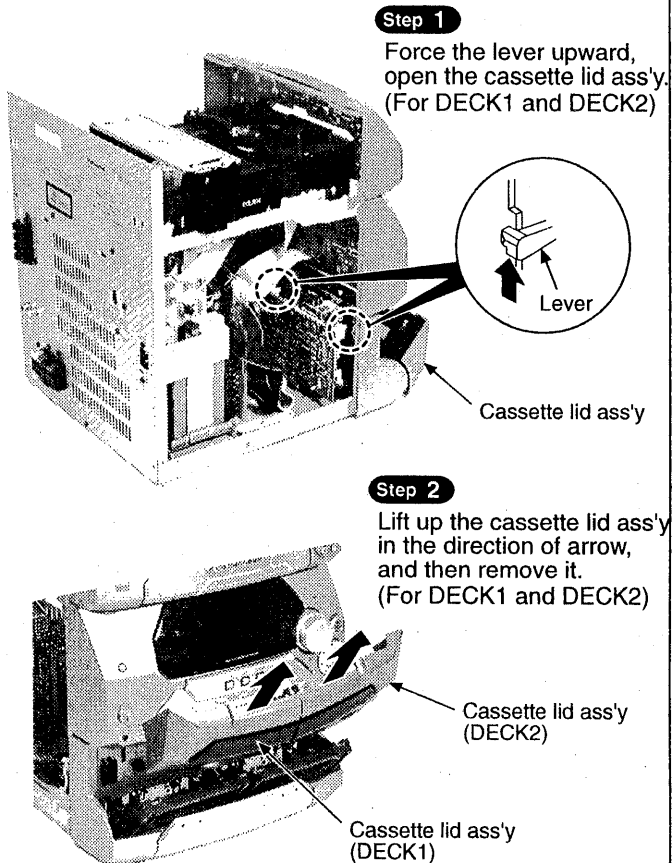
7. Replacement for the components parts on the mechanism P.C.B. (Cassette mechanism)

- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..
- Follow the disassembly instruction for the CD changer unit of the item 2 (2-1/2-2).
- Follow the **Step 1** ~ **Step 5** of the item 3 (3-4) in disassembly instruction for checking procedures of each P.C.B..
- Follow the **Step 1** ~ **Step 6** of the item 5 in main component replacement procedures/each parts disassembly and reassembly.



8. Replacement for the cassette lid ass'y

- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..

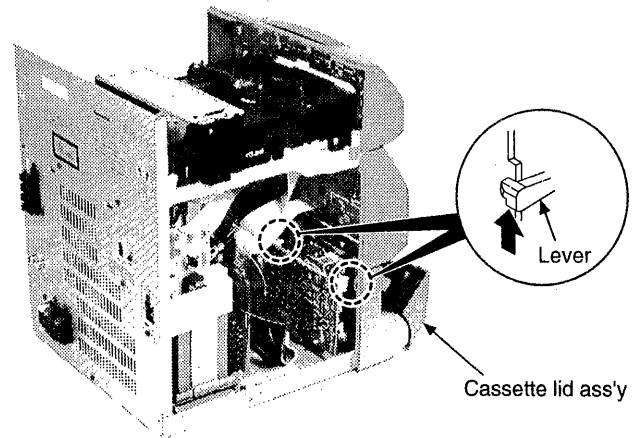
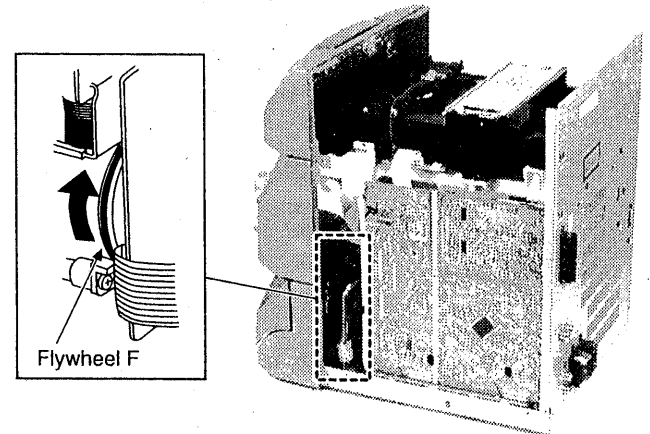


Measure for Tape Trouble

- Follow the **Step 1** ~ **Step 3** of the item 1 in disassembly instruction for checking procedures of each P.C.B..

Step 1

If a cassette tape cannot be removed from the deck since the tape is caught by the capstan or pinch roller during playback or recording, rotate the flywheel F in the direction of the arrow to remove the tape.



Step 2

Force the lever upward and open the cassette lid ass'y. Take the cassette tape off.

